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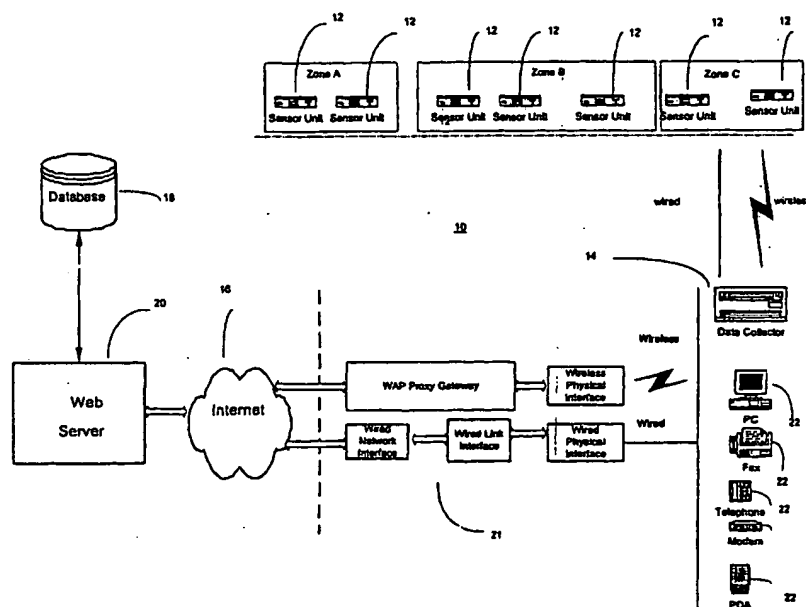
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(54) Title: REMOTE DETECTION, MONITORING AND INFORMATION MANAGEMENT SYSTEM



(57) Abstract: A remote detection system senses a condition and an electrical signal is generated that corresponds to the condition, which is communicated over a communication link. Both a system hardware and communication architecture and a software data processing system are provided to permit gathering, transmission, processing, storage, access, presentation and use of the data gathered by the detection, monitoring and management system of the present invention.

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REMOTE DETECTION, MONITORING AND INFORMATION MANAGEMENT SYSTEM

CROSS REFERENCE

This application is a continuation-in-part (CIP) of U.S. Patent Application Serial No. 09/642,589 filed August 22, 2000.

FIELD OF THE INVENTION

This invention relates to the use of remote detection methods to provide a repository of information which is remotely accessible for computerized management, monitoring and control of a condition; and in particular to the use of remote detection systems to provide a database that is accessible over a computer network such as the internet for use in pest monitoring, management and control.

BACKGROUND OF THE INVENTION

The present invention addresses problems existing in the pest control industry with respect to pest detection, monitoring, management and control. Integrated pest management ("IPM") involves the coordinated use of pest and environmental information with available pest control methods to prevent unacceptable levels of pest damage by the most economical means and with the least possible hazard to people, property and the environment.

Conventional pest management typically consists of two separate steps: detection and preventative and corrective treatment. Detection involves the physical inspection of a facility for pests. If activity is spotted, the area is treated with pesticides to control the insect population. This type of monitoring system requires regular examination of the premises by a technician in order to determine the amount of pest activity. The greatest expense a pest control facility faces

is the labor involved with the constant inspection of all customer locations. Approximately 75 percent of a technician's time is spent performing on site inspections. Pest management services historically have been curative treatments that require little extended service. More recently they have become and in some cases are becoming longer term monitoring and preventative services. The difficulty in the industry has been proving these services as a value to the customer for the long term. The industry can be divided into three different types of services, some companies provide all three services, while others only one or two of them. These include commercial integrated pest management ("IPM"), termite monitoring, and residential treatments. Each adheres to the more recent trend towards long term monitoring and preventative services.

Commercial IPM is the regular monitoring, inspection, and treatment of commercial facilities for existing and potential pest problems that could be damaging to the business of the customer. This includes both multi-location and single location businesses, including food management businesses, schools, hospitals, child and elderly care facilities, warehouses, etc. Not only are pest problems damaging to these operations, but the extensive use of chemicals to treat these problems can be damaging as well. In order to keep the level of chemical usage to a minimum, commercial IPM practices include regular inspections to identify problems before they become damaging and using mechanical trapping devices, natural predators (e.g., insects that eat other insects), insect growth regulators, mating disruption substances (pheromones), and if necessary, chemical pesticides. The problem with Commercial IPM services is that it can be expensive for a pest control operator to provide since it inherently requires a high level of cooperation and interaction with the customer. This is a level of service that requires resources that many pest control operators cannot afford to maintain.

Termite baiting systems have become a regular practice in the pest management industry for the elimination of termites. Systems such as Dow AgroSciences' Sentricon Colony Elimination System™ are being widely used by pest control operators to eliminate termite colonies and monitor for new colonies. Termites feed on wood, which is the material that many homes are constructed with. One home can have several colonies of termites living near it, and each colony has foragers that seek food for the colony. The foragers dig through the soil until they find a food source, whereupon the rest of the colony is alerted as to the location of the food source. The tendency of homeowners to cancel service once a termite colony is eliminated creates the potential for future damaging termite problems, because the elimination of one colony near a home does not prevent other still-existing colonies from foraging for food near (and thereby finding their way into) the home at the same time.

Residential treatments include all services provided to homeowners other than termite treatments. These services can be broken down into two different types of offerings, Quarterlies and Warranties. Quarterlies are contracts that a pest control operator has with a residential customer to provide primarily exterior perimeter treatments of the home on a quarterly basis. These treatments focus on forming a barrier around the outside of the home to prevent pests from entering the structure as well as monitoring for trouble spots that may need special attention by the homeowner. Warranties are similar to insurance policies in that the pest control operators sell a guarantee for treatments covering a certain period of time. If the treatments are unsuccessful and pest damage occurs the pest control operator pays for any damage caused up to a certain dollar amount and retreats the structure. Warranties are usually treated once, when the warranty is sold. Similar to termite baiting systems, the problem with residential treatments is that it is difficult to prove the long term value of the process to the customer since they rarely see

their home being serviced. At most the homeowner will receive a notification that the pest control technician was there.

In general, conventional pest detection systems only detect the presence or absence of a particular environmental factor, for example, whether a circuit is broken or not, or whether vibrations are present or not, etc. As a result, the conventional pest detection data can only serve a limited purpose in connection with pest management process. Conventional methods that monitor and control pests are disclosed in U.S. Patent Nos. 4,937,555 and 4,941,356. These methods use probes that detect insect vibrations within a particular media, such as stored grain or wood substrate. Under these methods, a detection device is manually inserted into a test media, requiring the presence of a technician who monitors insect vibrations. In addition, U.S. Patent No. 5,566,069 discloses embedding wires in an edible bait block that upon structural destruction cause a detecting terminal to come into contact with a magnetic circuit, whereby an alarm is activated. Moreover, U.S. Patent No. 5,575,105 discloses block holes with an emitting element at one end and a receiving element at the other. A warning is triggered when an insect traveling through the hole breaks the wave produced by the elements. Other conventional methods remotely monitor and collect data via sensors that transmit pest related data to a data collection unit. For example, U.S. Patent Nos. 5,005,416 and 5,285,688 disclose an apparatus that may be lowered into stored grain or corn for sensing insect vibrations. Related data is transmitted to a host computer for processing and issuing alerts. Similarly, U.S. Patent No. 6,052,066 discloses a thin strip of conductive wire that is threaded through a sensor made of edible material. The sensor includes a break circuit that periodically or on demand communicates, via wired or wireless links, detection data to a data collection unit.

As a result of the above-described examples of shortcomings in pest detection, monitoring and management, there exists a need to gather, process and present pest related data in a more valuable way so that it can be used in a wider variety of pest management applications, and in other applications requiring the remote detection, monitoring and management of a condition, and the remote gathering, processing, storage, access, presentation and use of data relating to the monitored condition.

SUMMARY OF THE INVENTION

The present invention provides a system hardware and communication architecture along with a software data processing system to permit the novel gathering, transmission, processing, storage, access, presentation and use of data generated by remote detection, monitoring and management systems. Although the present invention is described with respect to presently preferred embodiments relating to pest detection, monitoring and management applications, it is understood that the features of the invention can be applied to any application requiring the remote detection, monitoring and management of a condition, and the remote gathering, processing, storage, access, presentation and use of data related to the monitored condition.

The invention preferably implements a sensing device for detecting the monitored condition, which can be any one or a combination of transducers, such as an optical sensor, a piezoelectric sensor, a pressure sensor, a microphone, a load cell or a camera, among other suitable transducers. The communication link over which the monitored data is communicated can be either a wired or wireless link. Examples of the wired link protocols that may be used in connection with the present invention include the TCP/IP, X-10, CeBus, and Lonworks protocols. The wireless link that can be used in an exemplary embodiment of the invention may

be configured to comply with any suitable wireless application or wireless air interface protocols. Moreover, a receiver can be used for receiving a request for information from the user over the communication link. In this way, the invention can establish two-way communication for transfer of data. For example, client stations connected to the Internet can be used to receive information originating from detectors located at various remotely monitored zones. Based on a user request, the transmitter can transmit the monitored data or other sensor unit related data on demand. Alternatively, the sensor unit can be programmed to transmit such data periodically, in predefined intervals or continuously.

In accordance with another aspect of the invention, a detection system uses one or more sensor units to generate the data representative of the monitored condition. A data collector receives the data monitored by the detector for transmission over the communication link to a server which processes the data for storage in a database and provides access to the database for retrieving and processing the stored data for use. In this way, the system of the invention can allow the user to make various determinations in connection with the detected condition. Data associated with the determinations can be transmitted via the Internet for further remote processing or viewing.

In addition, the present invention provides an application service provider ("ASP") database solution for service providers and their customers, accessible over a communication network such as the Internet, to allow the gathering, processing, storage, receipt and use of information related to the services provided to the customer, including use of detection data generated from remotely monitored conditions. The types of data and functionality provided by the ASP may be customized directly by the customer or service provider, and can change depending on the particular application (or type of service) for which the system is used by that

customer and/or service provider, which can result in multiple configurations existing for the same customer and/or service provider when the system is used for multiple applications. The ASP, either itself or through the service providers, hosts and maintains the core application hardware, software and databases (including security). Through a network communication link established over the Internet, customers and service providers can remotely input and access data, designate system users and access rights, and identify preferences to determine the functionality provided by the ASP. The system can be used on a multiple customer/multiple service provider basis, wherein more than one customer of each service provider can access the ASP to receive information from that service provider, or wherein each customer can access information from multiple service providers each having an account with that customer.

The preferred embodiment of the present invention relates to the remote sensing of at least one physical characteristic of one or more pests or baits or environmental conditions. For example, the physical characteristic can correspond to any one or a combination of weight, length, width, height, volume, scent, density, moisture, or acoustic characteristics of the pest or bait or environmental condition. A suitable sensing device generates an electrical signal that corresponds to a detected physical characteristic, with the generated electrical signal being applied to a processor. The processor processes the electrical signal to provide physical characteristic data. A transmitter transmits the physical characteristic data in accordance with a predefined messaging format over a communication link, such as the Internet. The physical characteristic data for pests, bait or environmental conditions can be used in a variety of pest management applications. For example, based on the physical characteristic data related to length, width, or height, the sensing system of the invention can determine the type of a detected pest. Similarly, based on physical characteristic data related to the volume, weight, or density of

the bait, the system can assess the effectiveness of the bait as applied to a treated zone or region. Also, based on physical characteristic data related to the moisture level at or near the sensor, the system can determine the type of treatment that may be necessary to prevent potential pest problems. The sensor unit can also transmit data related to any one of battery life, bait weight changes, sound identification, pest activity levels, bait age, bait status, etc. An identification module can provide sensor unit identification data that can also be communicated along with associated physical characteristic data.

These and other advantages of the invention will become apparent from a perusal of the following detailed description of the presently preferred embodiments of the invention taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a system that implements the present invention.

Fig. 2 illustrates the type of information that can be communicated with different user devices.

Fig. 3 illustrates an exploded view of an exemplary sensor unit in accordance with the present invention.

Fig. 4 illustrates a circuit board used in the sensor unit of Fig. 3.

Fig. 5 illustrates the printed circuit of Fig. 4 connected to one or more sensing devices.

Fig. 6A illustrates a flow chart of a pest management detection method in accordance with the present invention.

Fig. (6B) shows the hierarchical breakdown of administrative system functions provided by the present invention.

Fig. (6C) shows the basic process of the present invention.

Figs. (7A) through (7C) demonstrate the procedure used to customize the system for a designated customer of a particular service provider.

Figs. (8A) through (8J) demonstrate the procedure by which the service provider user inputs and a customer user accesses data recorded for an instance of service activity completed for a particular customer.

Figs. (9A) through (9L) demonstrate the types of functionality available for a pest monitoring service through use of the present invention, described with reference to a typical termite baiting process.

Figs. (10A) through (10Z) demonstrate the customer administration features of the system

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Both a system hardware and communication architecture and a software data processing system are provided to permit gathering, transmission, processing, storage, access, presentation and use of the data gathered by the detection, monitoring and management system of the present invention.

SYSTEM ARCHITECTURE

Referring to Fig. 1, a system 10 that advantageously implements the present invention is shown. The system 10 is preferably implemented over a communication network that provides wired or wireless links with sensor units 12, which operate in accordance with the present invention. The sensor units 12 can be placed in designated control and detection zones A, B, or

C. From a zone, each sensor unit communicates with a data collector unit 14 that collect information gathered from a number of the sensor units 12. The sensor units 12 can communicate with the data collector 14 through wired or wireless communication links. The wired communication link can, for example, be used for home appliance networking. Examples of such links include those defined by X-10, CeBus, and Lonworks standards. Various wireless links that support defined protocols can also be used for wireless communication of pest related data. The wireless physical channel for implementing the present invention can be either analog or digital radio frequency (RF) channels, for example, those that are based on Time Division Multiple Access (or "multiplexing") (TDMA) protocols. The system 10 can use a common unlicensed radio frequency band slightly under 1 Ghz. The communication protocol can be a proprietary or nonproprietary link protocol. Examples of the wireless protocols include those defined by GSM, IS-136, IS-95, Bluetooth, MEN, etc., and other IEEE standards

In the preferred embodiment, the present invention also uses the Internet 16, which is a collection of interconnected (public and/or private) networks that are linked together by a set of standard protocols (such as WAP, or TCP/IP) to form a global distributed network. The system of the present invention can use any one of open- or proprietary- network standards. As is known, Internet is a distributed network that supports the World Wide Web ("Web"). The Web refers generally to both (i) a distributed collection of inter-linked, user-viewable hypertext documents (commonly referred to as Web documents or Web pages) that are accessible via the Internet, and (ii) the user and server software components which provide user access to such documents using standardized Internet protocols.

Currently, the primary standard protocol for allowing applications to locate and acquire Web documents is HTTP, and the Web pages are encoded using HTML. WML is the markup

language used by WAP. The terms "Web" and "World Wide Web" encompass future markup languages and transport protocols which may be used in place of (or in addition to) HTML, WML, XML, WAP and HTTP. The present invention can also operate on internal networks (Intranets) and networks utilizing different communication protocols. A Web Site or server is a computer system that processes and serves informational content over the network using the standard protocols of the World Wide Web. Typically, a Web site corresponds to a particular Internet domain name and includes the content associated with a particular organization. As used herein, the term is generally intended to encompass both (i) the hardware/software server components that serve the informational content to users over the network, and (ii) the "back end" hardware/software components, including any non-standard or specialized components, that interact with the server components to perform services for Web site users.

As shown in Fig. 1, the system 10 includes a database 18, preferably implemented by conventional software such as Microsoft Access® or Sequel Server® that is accessible by a Web server 20, which is preferably implemented by an application programming interface (API) such as the Microsoft Windows® API. The Web server 20 communicates with wired or wireless user devices 22, for example, telephones, personal computers, facsimile machines, modems and personal digital assistants and their equivalents. In this way, data produced at the sensor units 12 can be collected at the data collector unit 14, which routes the data to the Web server 20 through the Internet 16 and network layer interfaces 21. The Web server 20 can periodically retrieve the sensor data gathered at the data collector unit 14 for storage in the database 18 after its transmission from the data collection unit 14 over the Internet 16 via network layer interfaces 21. The user devices 22 can then access the processed data for use in a desired pest management application by sending requests over the Internet 16 via network layer interfaces 21 to the Web

server 20 which then retrieves the requested data from the database 18 and transmits it back over the Internet 16 via network layer interfaces 21 to the user devices 22. Alternately, the user devices can receive unsolicited transmissions of the processed data from the Web server 20 in the same manner for use in a desired pest management application.

As shown in Fig. 2, the information with the user device 22 can be communicated in connection with an automated telephone response system. A personal computer that runs suitable management software can be used for Webbased query and other types of information access and retrieval over a modem link. A fax back service can be used to provide user defined reports of pest detection and control activity. A PDA may also be used to download site statistics.

The present invention utilizes the standard Internet protocols for the various user devices 22 and the data collector unit 14 that connect to the Web server 20. For wired devices, these standards include the well-known Ethernet and TCP/IP protocols. For wireless devices, the preferred embodiment of the invention uses a Wireless Application Protocol or other future standards. The WAP environment generally consists of a WAP client device, WAP Proxy/gateway, and WAP server. Any one of the user devices 22, the sensor unit 12, or the data collector unit 14, can operate as a WAP or TCP/IP Client.

Referring to Fig. 3, an exploded view of an exemplary sensor unit 12 in accordance with the present invention is shown. The sensor unit 12 has a base platform 23 that secures a printed circuit board 24, battery 26, a communication medium interface (e.g., antenna, wire, etc.) 28, and one or more sensing devices 30. As shown in Fig. 4, the circuit board 24 includes a Central Processing Unit (CPU) 32, communication link unit 34, Random Access Memory (RAM) 36, and I/O port 38. The CPU 32 can be any one of various microprocessors, for example, one that

is known as a Vector Microprocessor. In a well-known manner, the CPU 32 accesses the RAM 36 for retrieving, storing and communicating pest detection and control information in accordance with the invention. Using appropriately configured transmitter or receiver, a communication link unit 34 provides a link interface between the sensing unit 12 and the data collector 14. For example, an RF unit can provide a radio interface for communicating information to and from the sensor unit 12 through an antenna that transmits and receives RF signals. In this way, the sensor unit 12 can establish two-way communication for transfer of data. Alternatively, a wired link, for example, one based on the X-10 protocol, unit can be used to connect each sensor unit 12 to the data collector 14. In one exemplary embodiment, the sensor unit 12 uses the receiver for receiving a request for information over the communication link. Based on the request and under the control of the CPU, the transmitter can transmit the physical characteristic data on demand, or it can transmit the physical characteristic data periodically, in predefined intervals. Accordingly, the sensor unit 12 can execute a software for translating messages using a defined Application Programming Interface (API). The sensor unit 12 can also prioritize the pest or bait or environmental condition related messages for transmission over the communication link.

As shown in Fig. 5, the printed circuit 24 is connected to the I/O port 38 through a connector 40 that is attached to one or more sensing devices 30. The sensing devices are used for remote sensing of physical characteristics of pests as well as baits or environmental conditions. As described herein, bait comprises means, such as any attractant (e.g., food source, pheromone, etc.) that provides adequate pesticide (e.g., insecticide or rodenticide) exposure to and for a pest that would be detected by the system. In general, the bait can be any attractant that is used for attracting and terminating a targeted pest type of any kind, including insects, rodents,

ants, roaches, etc. An example of bait that can be used in connection with the present invention is granular, gel, liquid, or solid baits.

In one exemplary embodiment, the sensing device 30 can be an optical sensor or camera. One such camera is a CCD camera that is programmable to take a snapshot of a subject area in millisecond-range intervals. This type of sensor provides digital images based on which the width, length, height or speed of an object, such as a pest, can be detected. In another exemplary embodiment a pressure-sensing device, such as a scale or a load cell, can be used to measure mass changes in milligram resolutions. In general, the sensing device 30 can be any transducer that generates an electrical signal in accordance with a physical characteristic of any pest or bait or environmental condition. The transducer can generate the electrical signal in connection with to any one or combination of weight, length, width, height, volume, scent, noise, acoustic, speed, chemistry, temperature, moisture, or density of the pest or bait or environmental condition or other measurable physical characteristic. The generated electrical signal is applied to the CPU, which processes the electrical signal to provide physical characteristic data messages. The CPU can be programmed to appropriately format the physical characteristic data messages so that it can be transmitted over the communication link. An identification module 42 can also be included in the sensor unit 12 for identifying the sensor unit and/or its associated zone.

Referring to Fig. 6A, a flow chart of a detection method in accordance with the present invention includes sensing a physical characteristic of at least one of a pest and a bait or environmental condition, block 610, generating an electrical signal that corresponds to the physical characteristic, block 620 and processing the electrical signal to provide physical characteristic data, block 630, and transmitting the physical characteristic data over a communication link, block 640. The data collector unit 14 receives the physical characteristic

data from the detector 12 and routes it to the Web server 20 to be used for pest detection and control applications. The database 18 stores detection data received from the Web server 20 that has been processed by detector 12 and/or data detector collector unit 14 and/or Web server 20 as derived from the received physical characteristic data. For example, based on the length, width or height physical characteristic data of a pest, the sensing system of the invention can determine the type of a detected pest. Similarly, based on physical characteristic data related to the volume, weight, or density of the bait, the system 10 can assess the effectiveness of the bait as applied to a treated region. The database 18 is accessible by the Web server 20 for storing and retrieving any pest control and detection data. In this way, client stations, such as user devices 22 (shown in Fig. 1) can be used to request and/or receive pest detection and control information originating from various remotely monitored zones. The sensor unit 12 can also transmit messages related to the remaining battery life, bait or pest weight changes, sound identification pest activity levels, bait age, or bait status.

From the foregoing, it would be appreciated that the present invention can capture and communicate valuable data usable for variety of pest management application. Because the sensor units of the present invention are micro-processor based, they can be programmed to process the physical characteristic data in any suitable manner. For example, the CPU can be programmed to make differential measurement determinations related to a change in a physical characteristic, such as weight, length, etc. Related data derived from such determinations can be routed, via the data collection unit 14, to the Web server 20, for the processing and user interface.

SYSTEM USE

The preferred embodiment implements an application service provider ("ASP") database solution, accessible over the Internet, to allow both service providers and their customers to process information pertinent to the services provided to the customer, such as schedules, project completion status, monitored conditions, account tracking, etc... The types of data and other system functionality and preferences provided by the ASP may be customized directly by the customer or service provider. The ASP, either itself or through the service provider, hosts and maintains the core application hardware, software and databases (including security). Through a network communication link established over the Internet, customers and service providers remotely input and access data, designate system users and access rights, and identify preferences to determine the system functionality provided by the ASP, all of which is managed by the Web server 20 which processes the system data for storage in the database 18 and also processes the inputs made and outputs received by the users. Fig. (6B) shows the hierarchical breakdown of administrative system functions provided by the present invention. Fig. (6C) shows the basic process of the present invention wherein the service provider gathers the monitored data from the customer for input into the database and later access and use by the customer and/or service provider via the ASP system over the Internet. The presently preferred embodiment of the software system which permits gathering, processing, storage, access, presentation and use of the data collected by the present invention is shown with reference to Figs. (7) through (10) in the preferred embodiment of a pest detection, monitoring and management system.

There are three categories of users who may use and access the system data and functions provided by the ASP. Administrative users are agents of the service provider that designate

other users and their access rights, and configure the system to provide the functionality and data desired by the service provider and its customers. Service provider users are representatives of the service provider that are designated by an administrative user to have access to selected features of the system in order to input, retrieve and process data managed by the system for the service provider and its customer(s). Service provider users may be given differing access rights to system features and data to restrict use to only certain projects and/or customers. Customer users are representatives of customers of the service provider that are designated by an administrative user to have access to selected features of the system in order to input, retrieve and process data managed by the system for that customer's accounts and projects. Like service provider users, customer users are given differing access rights so that they will only have use of system features and data for their own projects and accounts, as specified by the administrative user. All users may access the system features and data to which they have been given rights through an Internet browser (preferably Internet Explorer 5x or above). However, in order to perform data input and other administrative tasks, administrative users and service provider users are provided with an administrative "thin-client" application, which can be made available by the ASP over the Internet. The administrative thin client is a self-contained software module that, once downloaded, resides on the user's local computer and enables access to the ASP server software over the Internet to perform administrative tasks or data input. Without an installed administrative thin client and appropriate user access rights, no administrative tasks or data entry can be done. Administrative users manage user names and passwords for each service provider user and customer user to control access rights and security. Administrative users also have the ability to perform any and all of the tasks performed by service provider users and customer users.

Figs. (7A) through (7C) demonstrate the procedure by which the administrative user customizes the system for a designated customer of a particular service provider, including designation of customer users and customer groups, respectively. Figs. (8A) through (8H) demonstrate the procedure by which the service provider user inputs data to record an instance of service activity completed for a particular customer; including, respectively, identification of the type of service activity provided, entry of a new record for that particular instance of service activity, identification of the unit serviced, identification of the severity of the problem found, identification of the type of problem found, identification of the action taken in response to the problem, and an indication of comments describing any special circumstances concerning the problem. Fig. (8I) demonstrates the procedure by which the service provider user edits data for a recorded instance of service activity, which includes the capability to modify each of the pieces of information originally recorded. Finally, Fig. (8J) demonstrates the procedure by which the customer user accesses data relating to a recorded instance of service activity, after its generation and entry into the system by the service provider.

Figs. (9A) through (9L) demonstrate the types of functionality available for a pest monitoring service through use of the system of present invention, described with reference to a typical termite baiting process. Termite monitoring is typically accomplished by installing monitoring stations around the outside and inside of the monitored structure. The termites will feed on a wood stick installed in the station prior to feeding on the structure. The stations are checked regularly for termite activity, and if found, the wood stick is replaced with a bait tube containing the termites. The termites feed on the chemicals in the bait tube and return to the colony to send other termites to feed on the bait tube. Eventually, this process kills the colony and the bait tube is replaced with a new wood stick to continue to monitor for new termite

colonies near the structure. The functions shown in Figs. (9A) through (9L) will change depending on the particular type of service being monitored by the system. Prior to the present invention, the customer was typically given little information relating to the status of these types of processes.

The status of each station can be updated using the automatic monitoring system 10 of the present invention, or alternately by manual recording of the status using for example a barcode reader. This information is loaded into the database 18 via the Web server 20 over the Internet 16, whereupon a new service record is generated and notification of the customer and/or service provider is accomplished via an email link to the Internet web page containing the login screen for the ASP system, as shown in Fig. (9A). The user responds to the login screen by providing a username and password to obtain access to the system, as shown in Fig. (9B). Once logged into the system, the customer is presented with a summary screen for the provider of the monitoring service information being accessed, as shown in Fig. (9C). A selection of the service provider for the particular information being retrieved would be necessary if more than one provider is servicing that customer, as shown in Fig. (9CC). The summary screen presents the user with overview information regarding the customer account being serviced along with a message from the service provider. The summary screen is divided into three areas. One area identifies basic system functions and user logon information. Another area identifies the service provider and the system functions made available to the user by that service provider. Based on the selection made from the list of functions available, the remainder of the screen is populated with information made available to that customer by the service provider.

As shown in Fig. (9C) the system offers the user five report functions (although a larger or smaller number can be made available), including account status, service schedule, building

layout, detail report, and comments, respectively shown in Figs. (9D) through (9F) and Figs. (9K) through (9L). Each of these functions is represented by a screen icon that provides a link to the application software module that executes the function by operating on the customer data managed by the service provider. As shown in Fig. (9D), the account status function displays the financial status for this particular customer account, including past payments made and the current payments due, and optionally providing the customer with the ability to select payment arrangements, including payment online. As shown in Fig. (9E), the service schedule icon displays a calendar for reviewing scheduled services, which is viewable in daily, weekly, monthly, and yearly increments and can be used to schedule visits by the service provider to the customer location in advance. An option is also available for displaying all services scheduled for that customer from all service providers. As shown in Figs. (9F) and (9G) the building layout icon displays an overhead layout of the customer location with the individual monitoring stations identified as well as any other area landmarks. Each station is color coded based on the monitored value assigned at the time of the last service, and the database 18 can be queried by service date to show the layout as it was on any given date. Each monitoring station on the layout can also be queried individually to display a status history for that station. This same type of module could be used for other monitoring systems to display status history for other types of services. As shown in Figs. (9H) through (9K), the detail reports icon provides the ability to query the database for specific detailed information regarding customer service history using pre-configured query options or user-created custom queries. Finally, as shown in Fig. (9L) the comments icon displays a web page allowing the user to create and send an email message to the service provider.

Figs. (10A) through (10Z) demonstrate the customer administration features of the system, which is designed for multi-location, multi-user organizations. The user login features are the same as described above with respect to Figs. (9A) through (9C). Once logged in, the customer administration functions are accessed by selecting the customer administration link on the service provider summary screen, as shown in Fig. (9CC). The customer administration functions are divided into three general areas (although a greater or lesser number can be specified), including group administration, email administration, and user administration, as shown in Fig. (10A).

As shown in Figs. (10B) through (10D), group administration can be used to create groups of units that can be accessed by users assigned to that group. Units are serviceable entities, for instance a store or restaurant, a department in a store, a monitoring station, etc. The administrative user designates a group type (for example all stores owned by a given company which are serviced by that service provider), then creates groups within the type (for example all stores of the designated company located within a given geographic area), then adds units to the group (i.e., each store of the designated company falling within the selected geographic area). Since units are hierarchical, a unit of a superior level includes all of its children. For instance, if a store has departments and the store is added to a group, then all of its departments are also added to that group. On the other hand, if just one department of a designated store is added to a group, it will be the only department within that store accessible to the selected group, unless remaining department(s) are separately added to the group. Hierarchical group definition allows reporting on all of the children of a given parent unit included within a group, while functional group definition allows reporting on units from different parents depending on whether the reported unit exhibits the selected function.

As shown in Figs. (10E) through (10J), email administration can be used to create protocols for notification emails to be sent to selected users. The three main elements to the email notification protocol are the frequency, day, and trigger for sending the email. The frequency is the regularity with which the user subscribers of the protocol will receive emails, for instance daily, weekly, monthly or only when the trigger is set off. The day is the calendar day on which the email notification will begin and the recurring day on which it will be delivered. The trigger is the event which will cause the email to be sent; for instance, every time a location in a group is serviced, or every time a certain value is set for a service.

As shown in Figs. (10K) through (10Z), user administration is used to define the users who are permitted access to the system along with their access rights.. Using the user administration functions, the administrative user can create and eliminate users, edit the access rights of existing users, and change user passwords; along with defining group assignments, email protocol subscriptions, and permitted system functions for the user. The access rights are configurable such that a given customer user is only permitted to use the particular types of data, functions and reporting units to which that user has been given access, while a given service provider user may be limited in access to only certain customers or services without having access to all customers or services of that provider. Finally, customers will be given access to information from all providers servicing that customer but will not have access to information from other customers even if those customers also are serviced by those providers, while service providers will be given access to information from all of the customers it services but will not be given access to information from another service provider even if that provider services the same customers.

Although the present invention has been described with respect to presently preferred embodiments related to pest detection and monitoring applications, it is understood that the features of the invention can be applied to any application requiring the remote detection and monitoring of a condition, and the remote storage and access of data relating to the monitored condition. As a result, it is to be understood the invention is not to be limited to the disclosed embodiments, but on the contrary is intended to cover various modifications and equivalent arrangements include within the spirit of the scope of the appended claims.

WHAT IS CLAIMED IS:

1. A system for processing information which is remotely accessible for computerized monitoring, management and control of a condition, comprising:
 - a. at least one sensing device that detects said condition to provide a corresponding electrical signal representative of said condition;
 - b. a data collector that processes said electrical signal to provide data relating to said condition;
 - c. a transmitter that transmits said data over a communication link;
 - d. a computer system that manages the remote gathering, transmission, processing, storage, access, presentation and use of said data.
2. The system of Claim 1 wherein said computer system comprises a server which processes said data for storage in a database and provides access to said database for retrieval and use of said data in making determinations related to the detected condition.
3. The system of Claim 2 wherein said server remotely hosts hardware and software for managing and maintaining said database and is accessible by users over said communication link.
4. The system of Claim 3 wherein said users comprise service providers and customers of said service providers and wherein said server provides data processing for said

service providers and said customers to allow gathering, transmission, processing, storage, access, receipt and use of data related to services provided to said customer over the Internet.

5. The system of Claim 4 wherein the types of data and the functions performed by said server in processing said data are specified by said customers or said service providers to customize input, access and use of said data or to designate system users and access rights for said users or to identify preferences for managing, processing and using said data.

6. The system of Claim 5 wherein multiple data types and multiple server functions are provided to said customers or said service providers such that said data types and server functions are modifiable for different services.

7. The system of Claim 6 wherein multiple data types and multiple server functions exist for a single customer or single service provider corresponding to multiple services provided to said customer.

8. The system of Claim 7 wherein more than one customer of a single service provider accesses said server for receipt of information of said customer provided by said service provider.

9. The system of Claim 8 wherein a single customer of more than one service provider accesses said server for receipt of information of said customer provided by each said service provider.

10. The sensor unit of claim 1 further including a receiver for processing a request for information over the communication link.

11. The sensor unit of claim 10, wherein said transmitter transmits said data based on said request.

12. The sensor unit of claim 11, wherein said transmitter transmits said data periodically or continuously.

13. The system of Claim 1 wherein said condition relates to at least one of a pest or a bait or an environmental condition.

14. The system of Claim 13, wherein said data corresponds to at least one of:

weight;

length;

width;

height;

speed;

scent;

acoustic;

volume;

density;

movement; and

moisture.

15. The system of Claim 1, wherein said sensing device comprises at least one of

an optical sensing device,

a pressure sensing device;

a load cell;

a camera; and

a moisture meter.

16. The system of Claim 1, wherein said communication link comprises at least one of

a wired link; or

a wireless link.

17. The system of Claim 16, wherein said communication link is configured in accordance with a predefined communication protocol.

18. The system of Claim 17, wherein said data is transmitted over said communication link in a predefined format.

19. The system of Claim 17, wherein the communication protocol correspond to at least one of

TCP/IP;

X-10 protocol;

CeBus; and

Lonworks.

20. The system of Claim 17, wherein the communication protocol corresponds to a Wireless Application Protocol.

21. The system of Claim 1 wherein:

a. said sensor unit generates physical characteristic data in connection with at least one of a pest or a bait or an environmental condition;

b. said data collector receives said physical characteristic data for transmission over said communication link;

c. said computer system comprises a server that processes said transmitted physical characteristic data to provide detection data; and

d. a database accessible by said server stores said detection data.

22. The system of Claim 21, wherein said physical characteristic data is processed to determine the type of detected pest or pest treatment.

23. The system of Claim 21, wherein said server provides access to said database over a network of interconnected client stations.

24. A pest detection method using the system of Claim 21, comprising:

- a. sensing a physical characteristic of at least one of a pest or a bait or a environmental condition;
- b. generating an electrical signal that corresponds to said physical characteristic;
- c. processing said electrical signal to provide physical characteristic data; and
- d. transmitting said physical characteristic data over a communication link.
- e. processing said transmitted physical characteristic data to provide detection data; and
- f. storing said detection data.

25. The method of Claim 24 further including detecting the type of a detected pest or determining the type of pest treatment based on the processed data.

26. The method of Claim 24 further including receiving request for information at a sensor unit.

27. The method of Claim 24 further including communicating at least one of the following parameters:

battery life of a sensor unit;

pest or bait weight changes;

sound identification;

pest activity levels;

bait age; bait status; and

moisture levels.

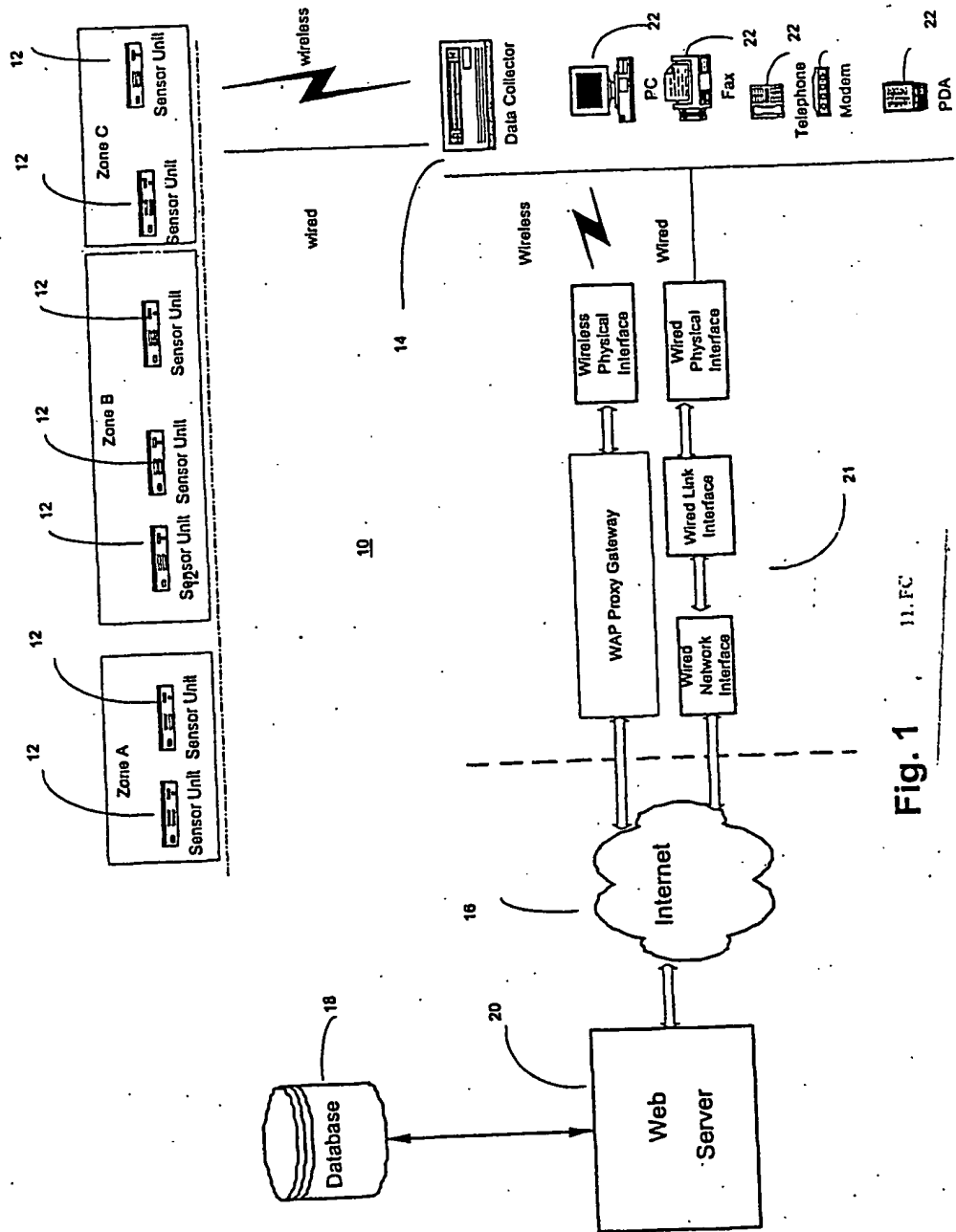


Fig. 1 11. FC

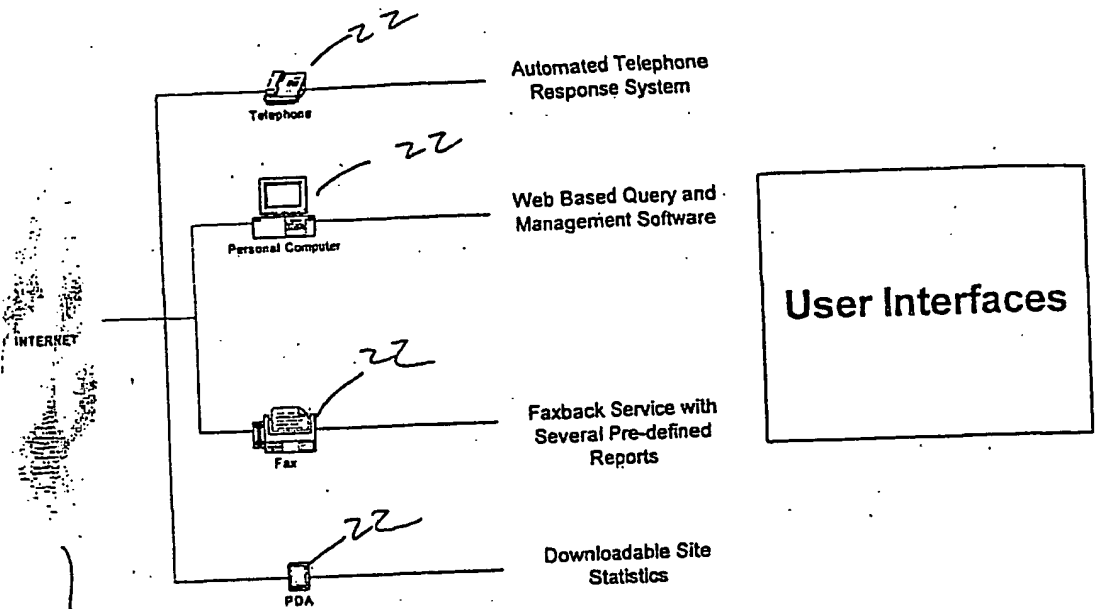


FIG. 2

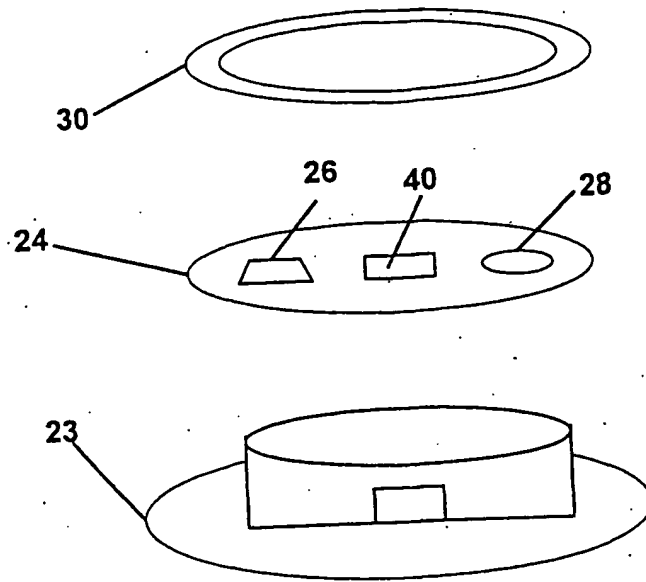
12

FIG. 3

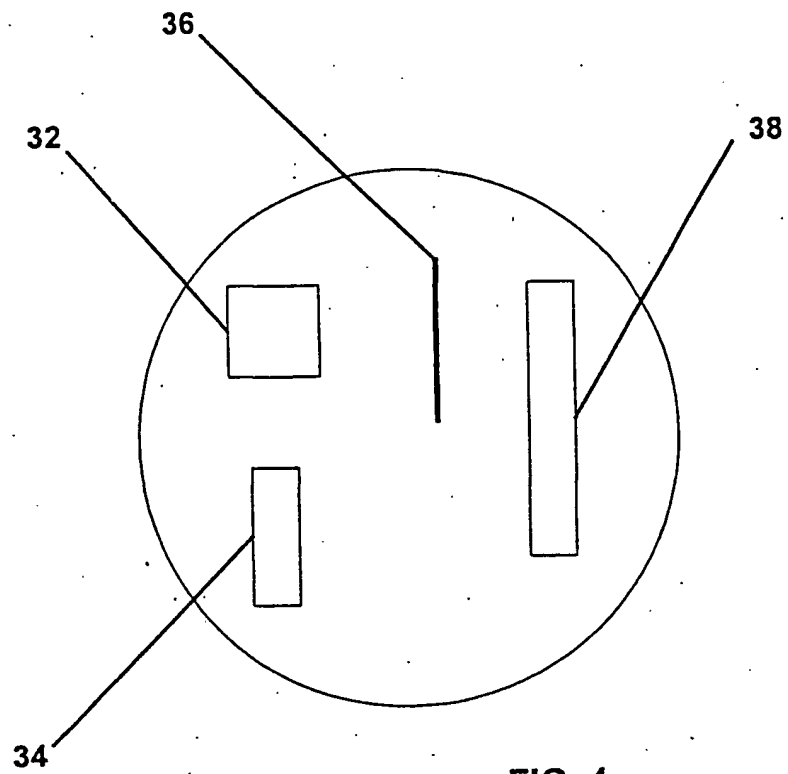


FIG. 4

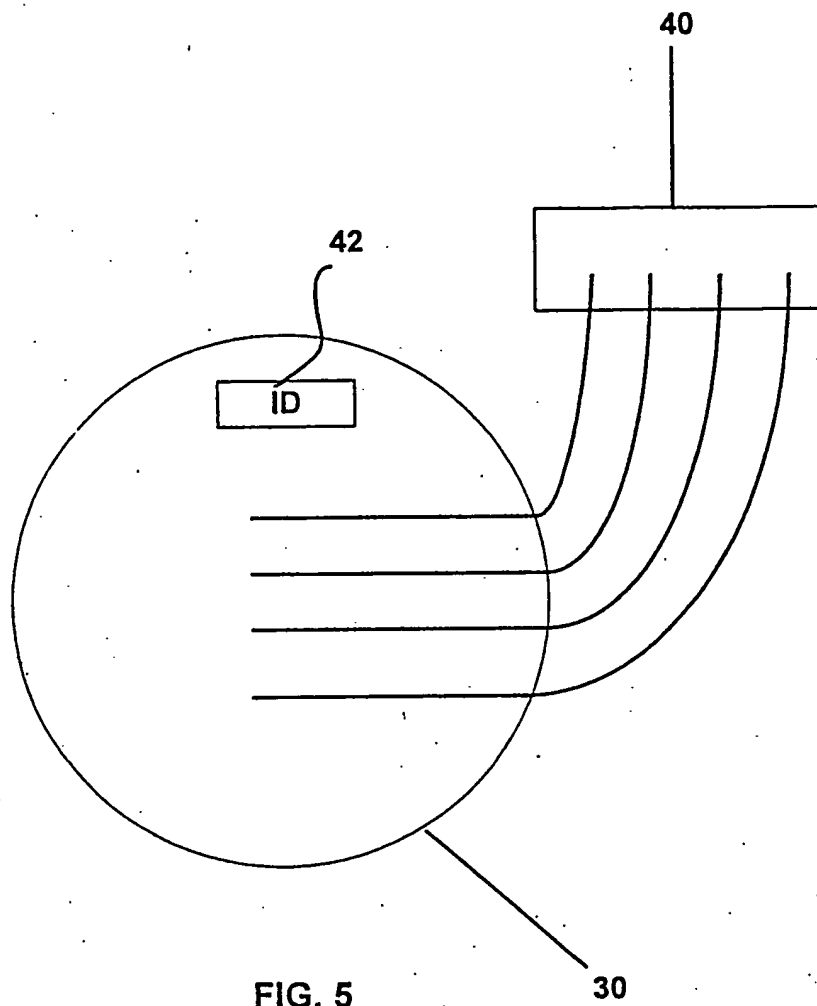


FIG. 5

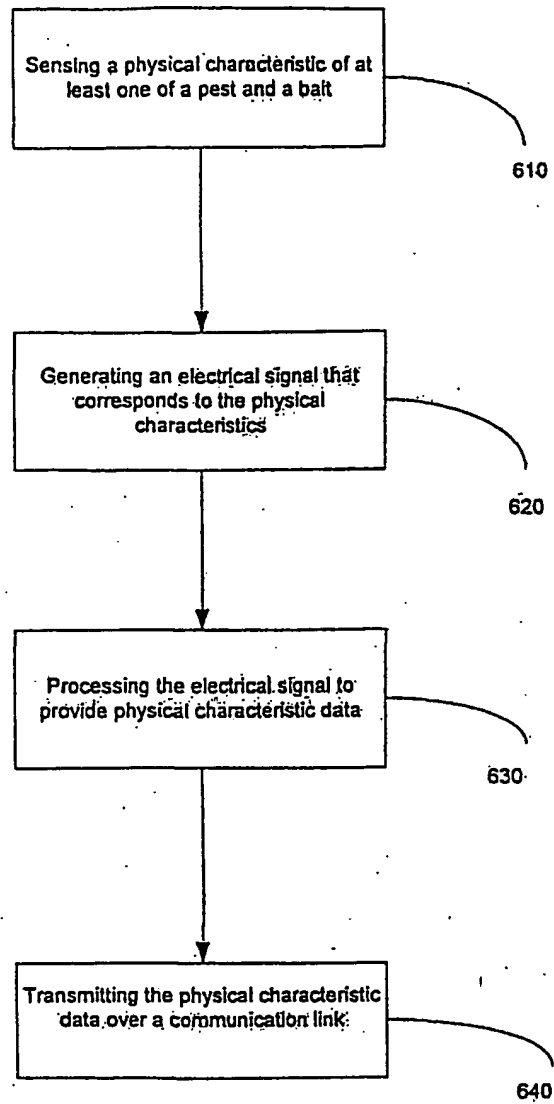


FIG. 6A

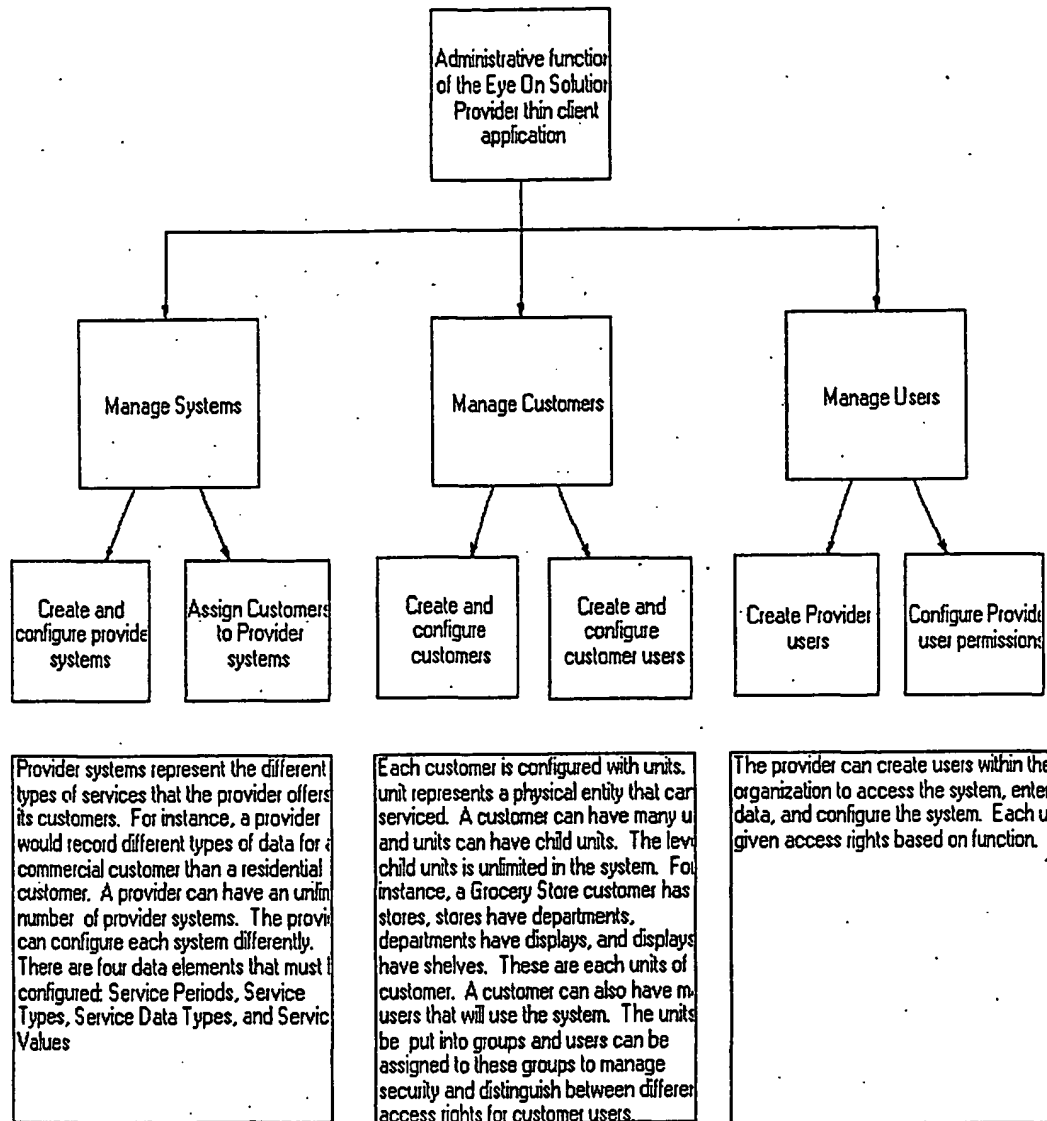


Fig. 6B

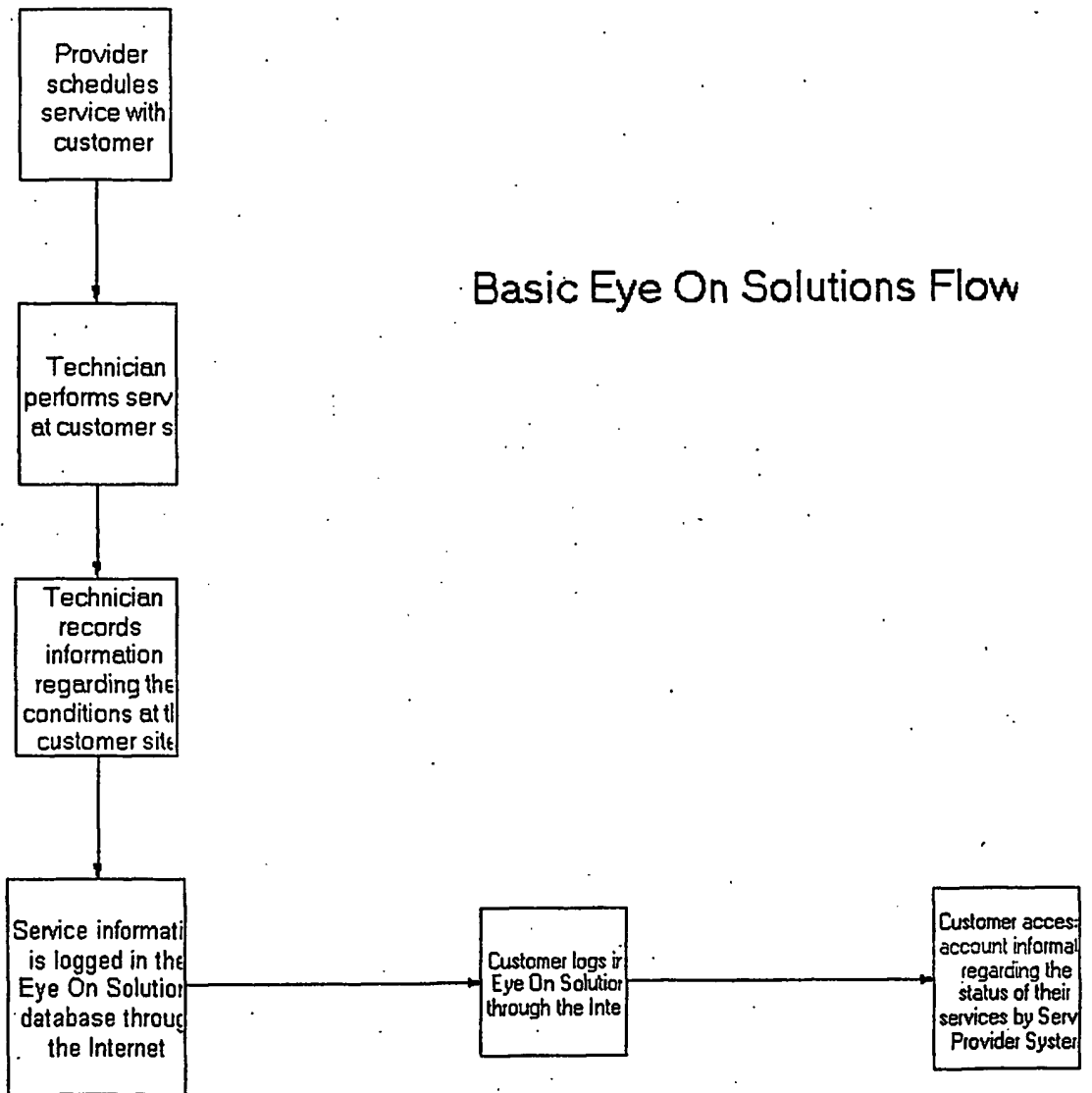


Fig. 6C

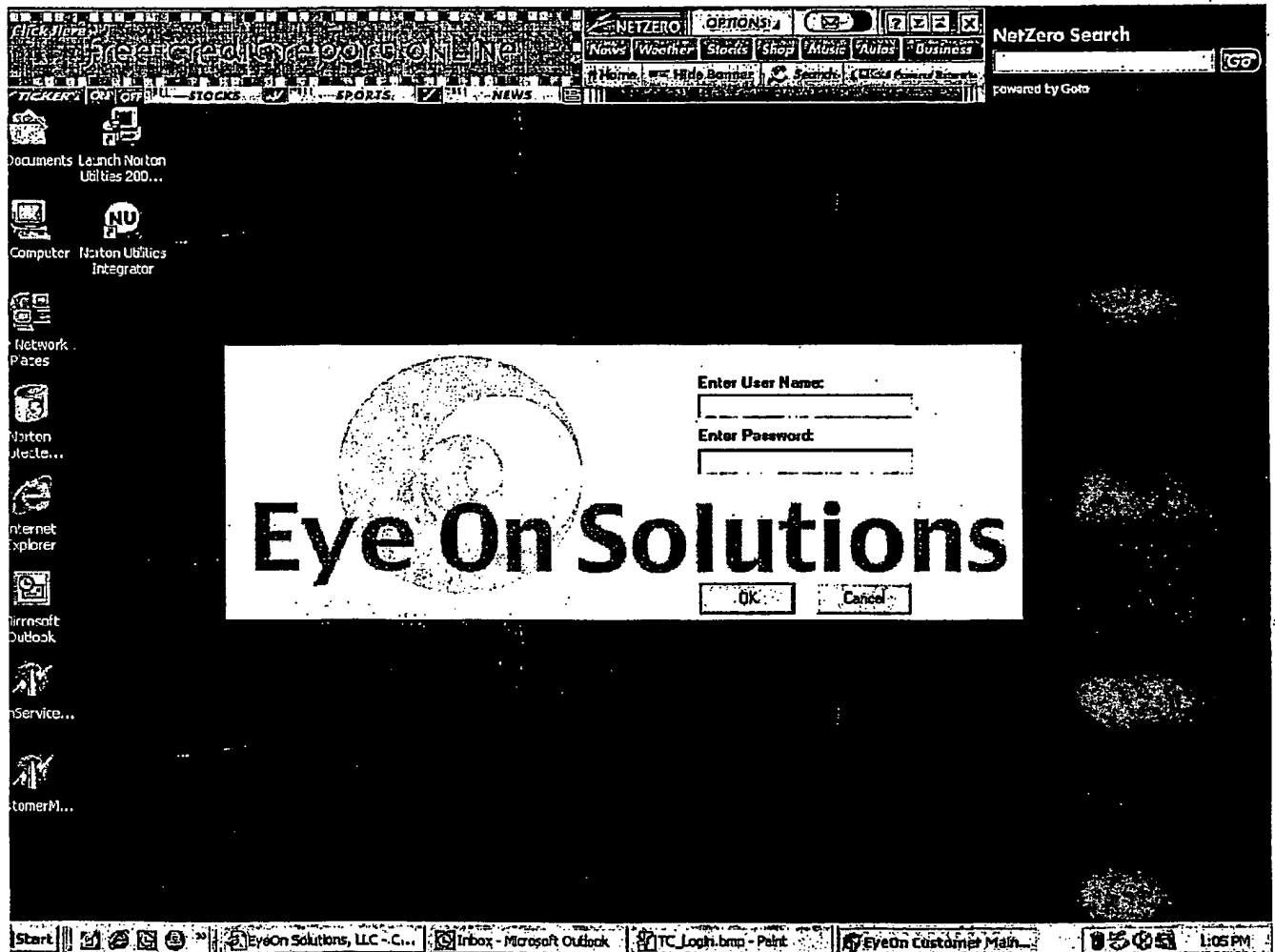


Fig 7A

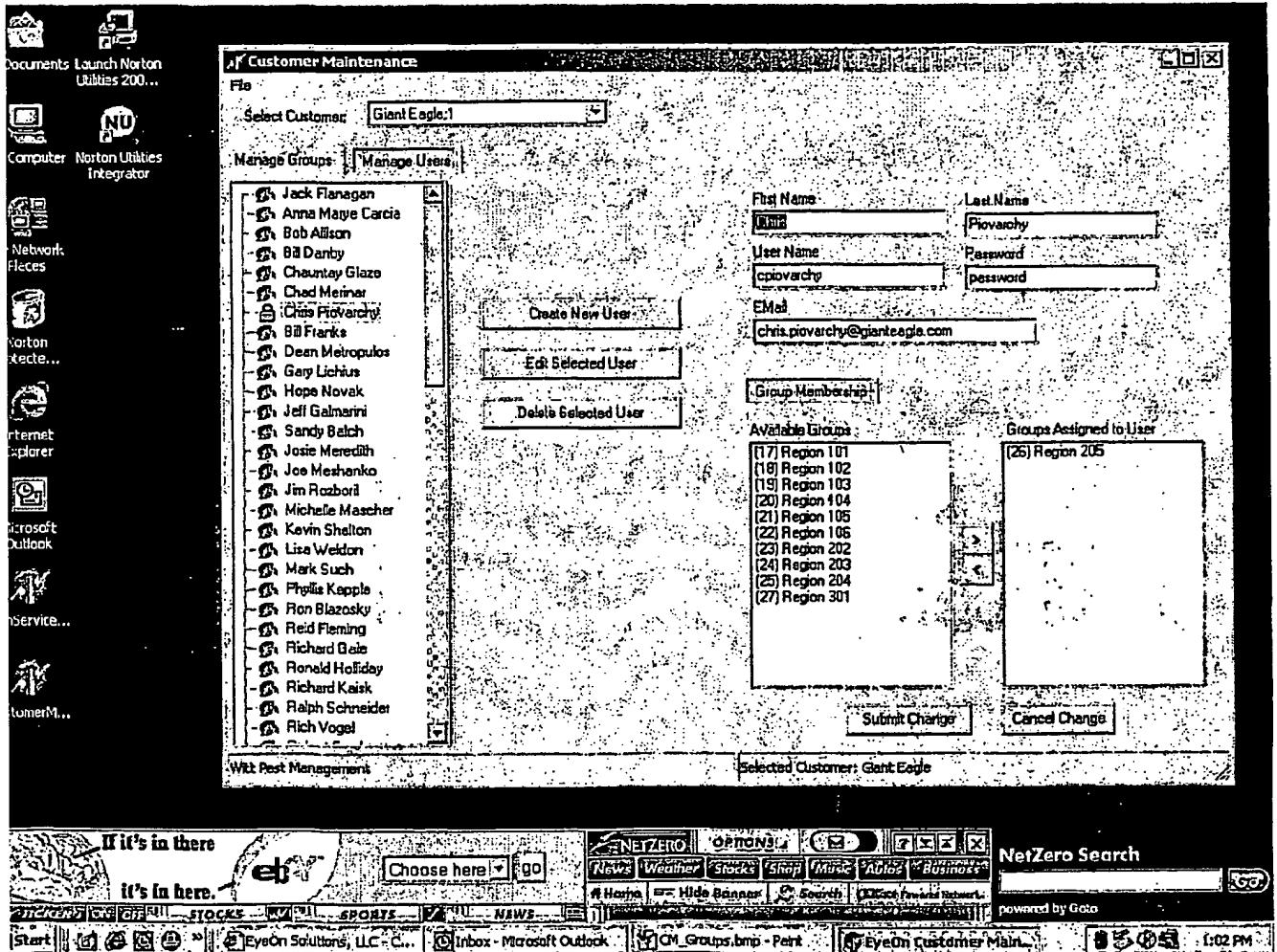


Fig 7B

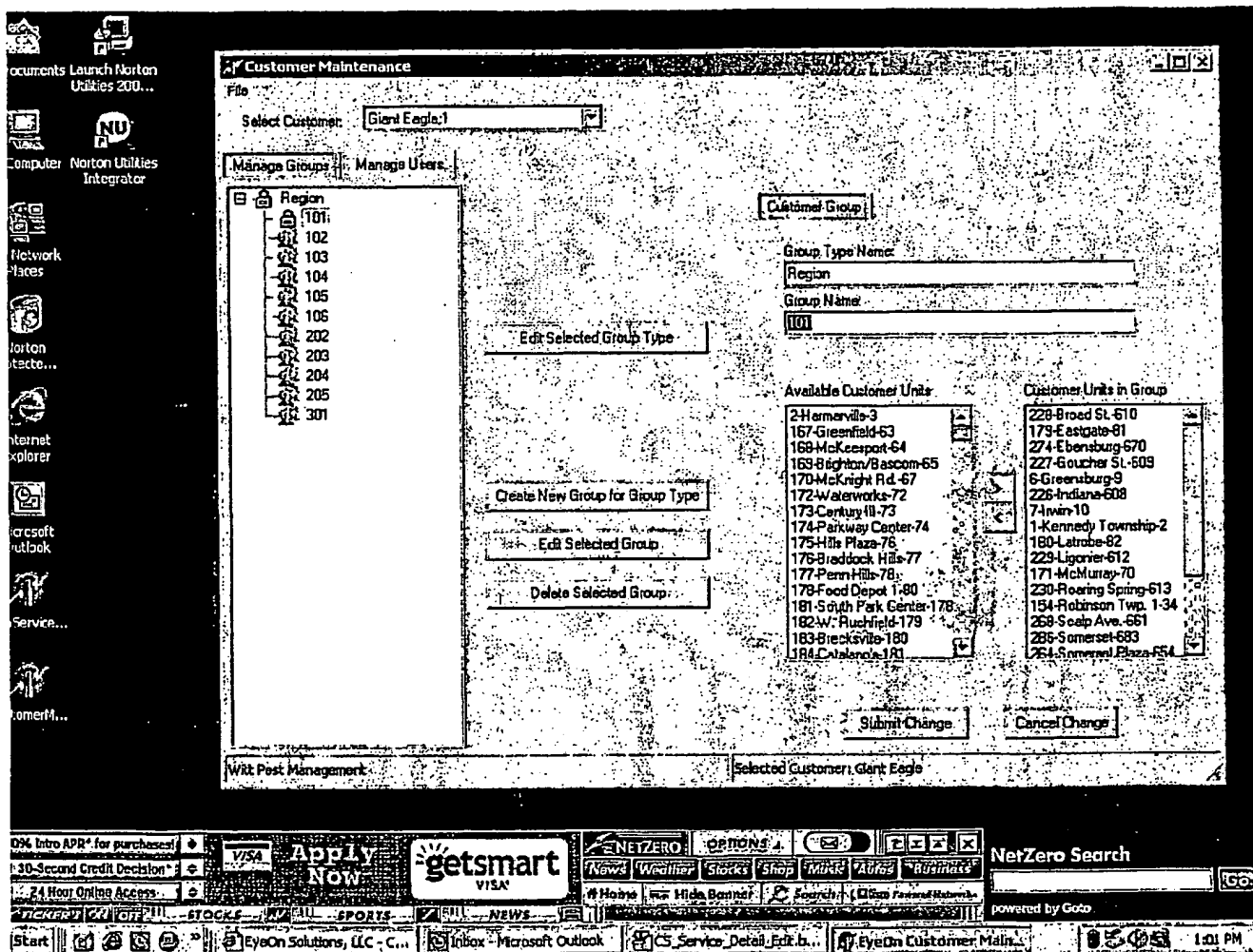


Fig 7C

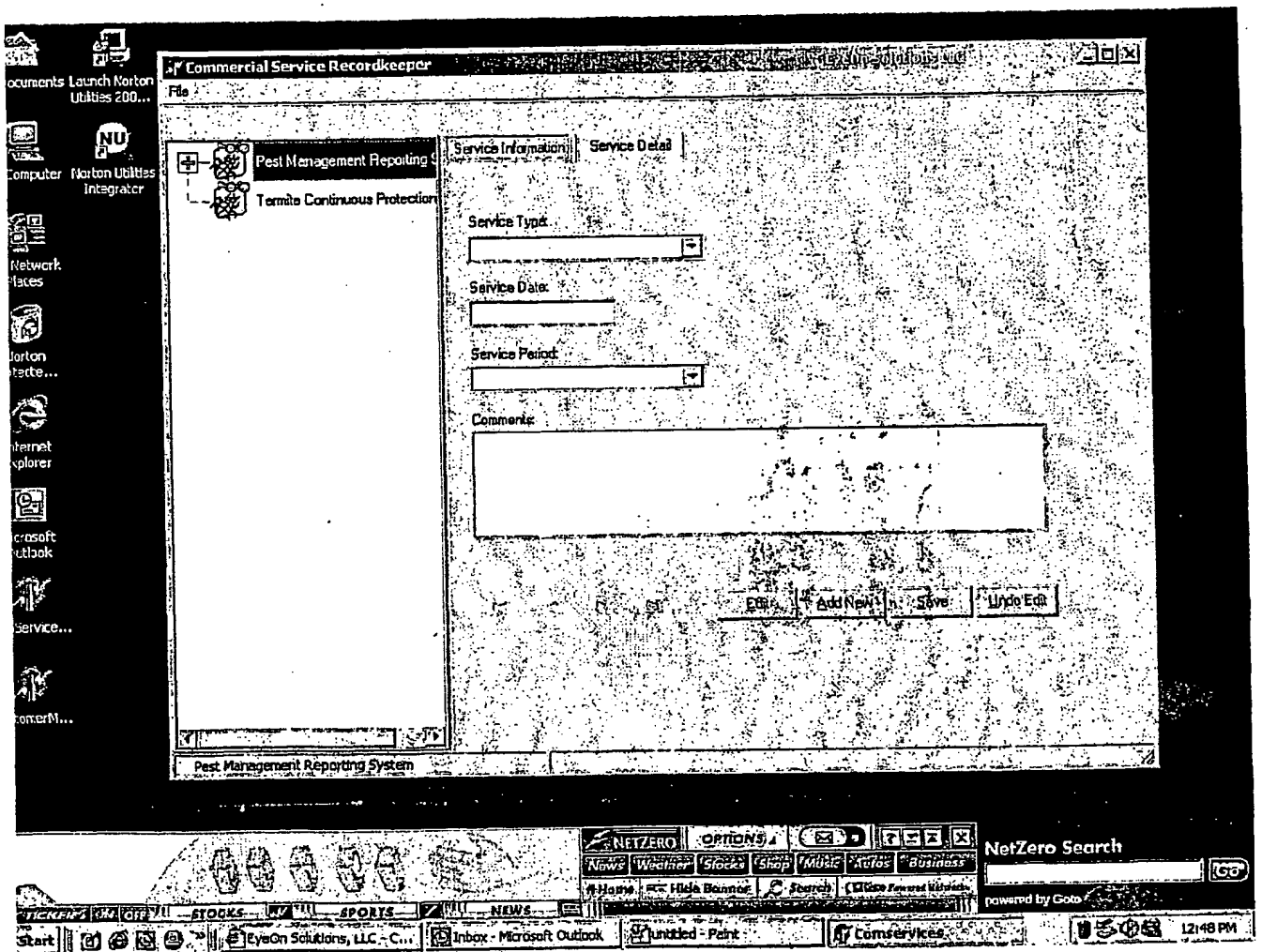


Fig 8A

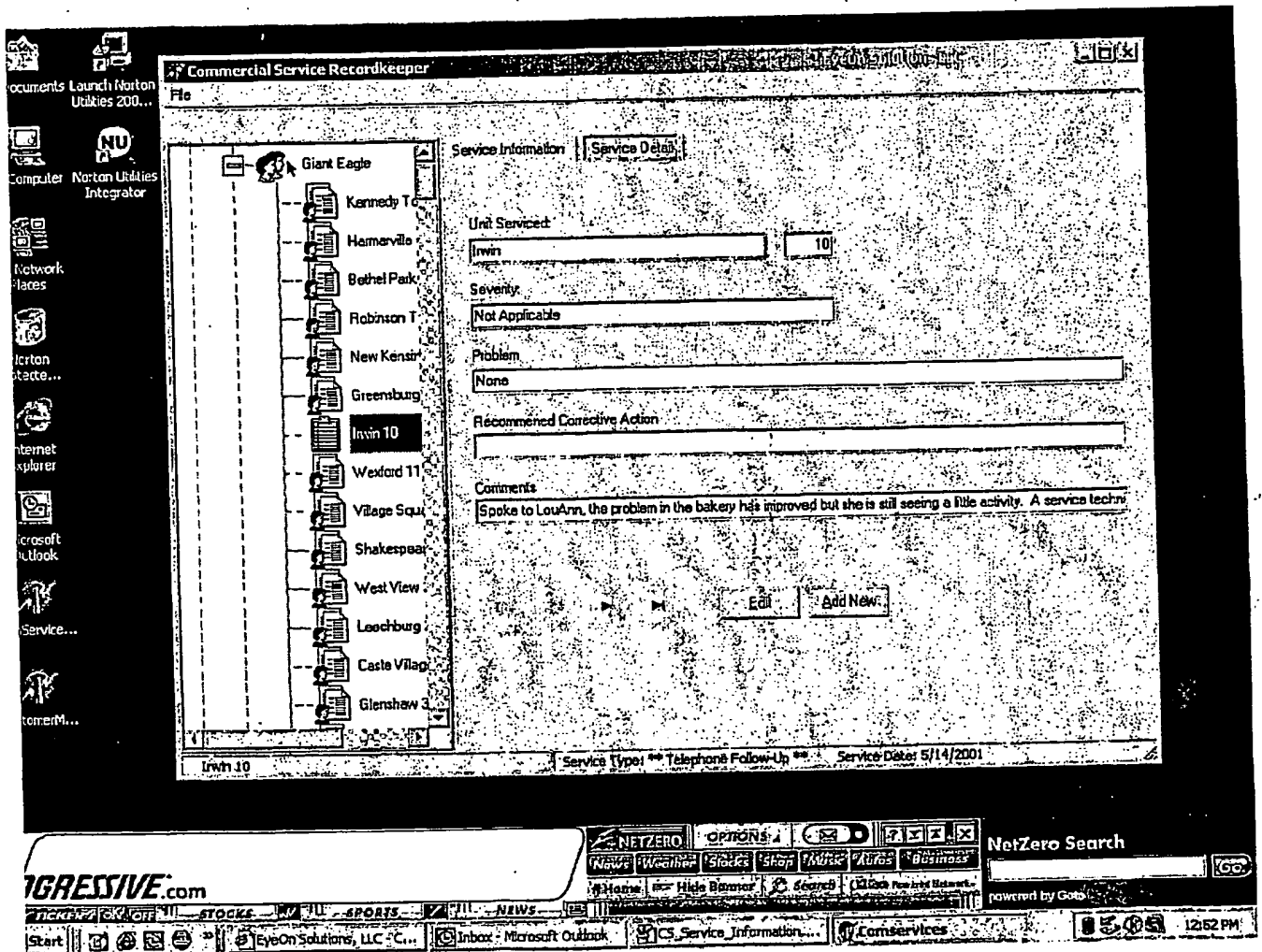


Fig 8B

Documents Launch Norton Utilities 200...
Computer Norton Utilities Integrator
Network Places
Norton Utilities
Internet Explorer
Microsoft Outlook
Service...
C:\Program Files\...

File Edit View Options Help
Giant Eagle Service Information Service Detail
Service Detail
Unit Served: [Dropdown]
Severity: [Dropdown]
Problem: [Text]
Recommended Corrective Action: [Text]
Comments: [Text]
Save Cancel
West View
Leechburg
Castle Vllag
Glenshaw
Edit Add New
Service Type: Telephone Follow-Up Service Date: 5/14/2001
Unwin 10

NETZERO OPTIONS
News Weather Stocks Shop Music Autos Business
Home Hide Banner Search Google Personal Network
NetZero Search
powered by Google
Start [Icons] EyeOn Solutions, LLC - C... Inbox - Microsoft Outlook PCS_Service_Detail.htm Comservices 12:53 PM

Fig 8C

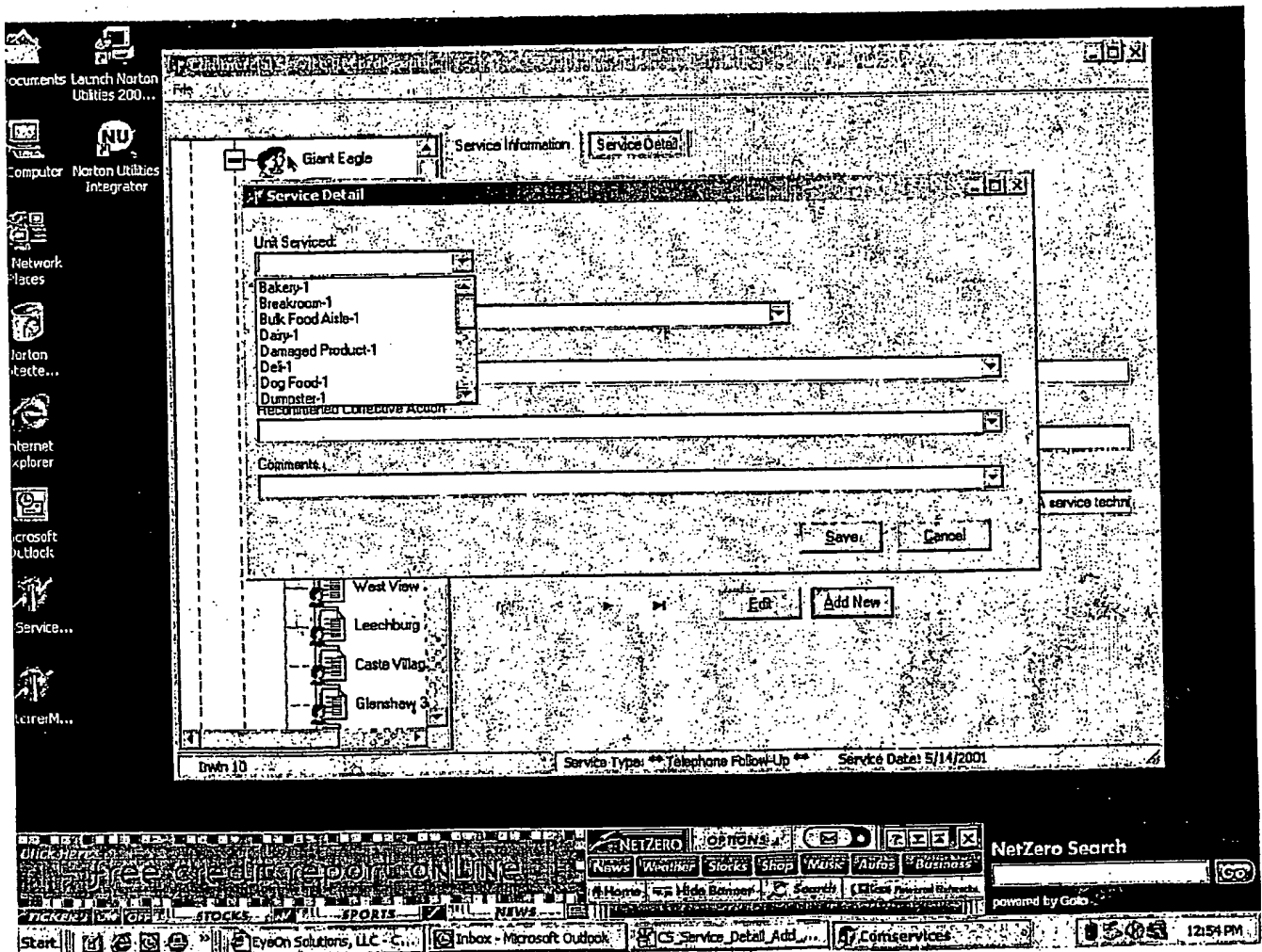


Fig 8D

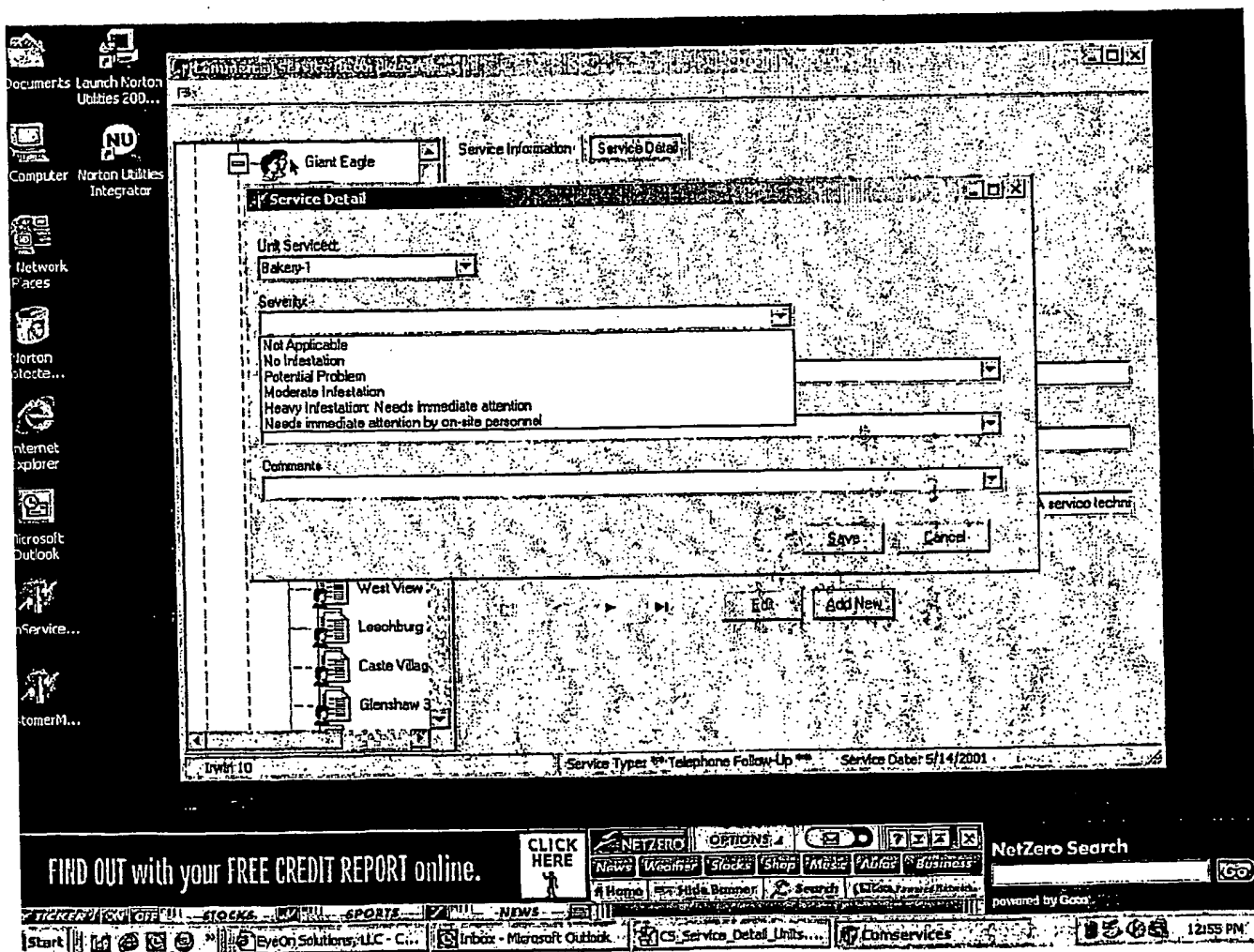


Fig 8E

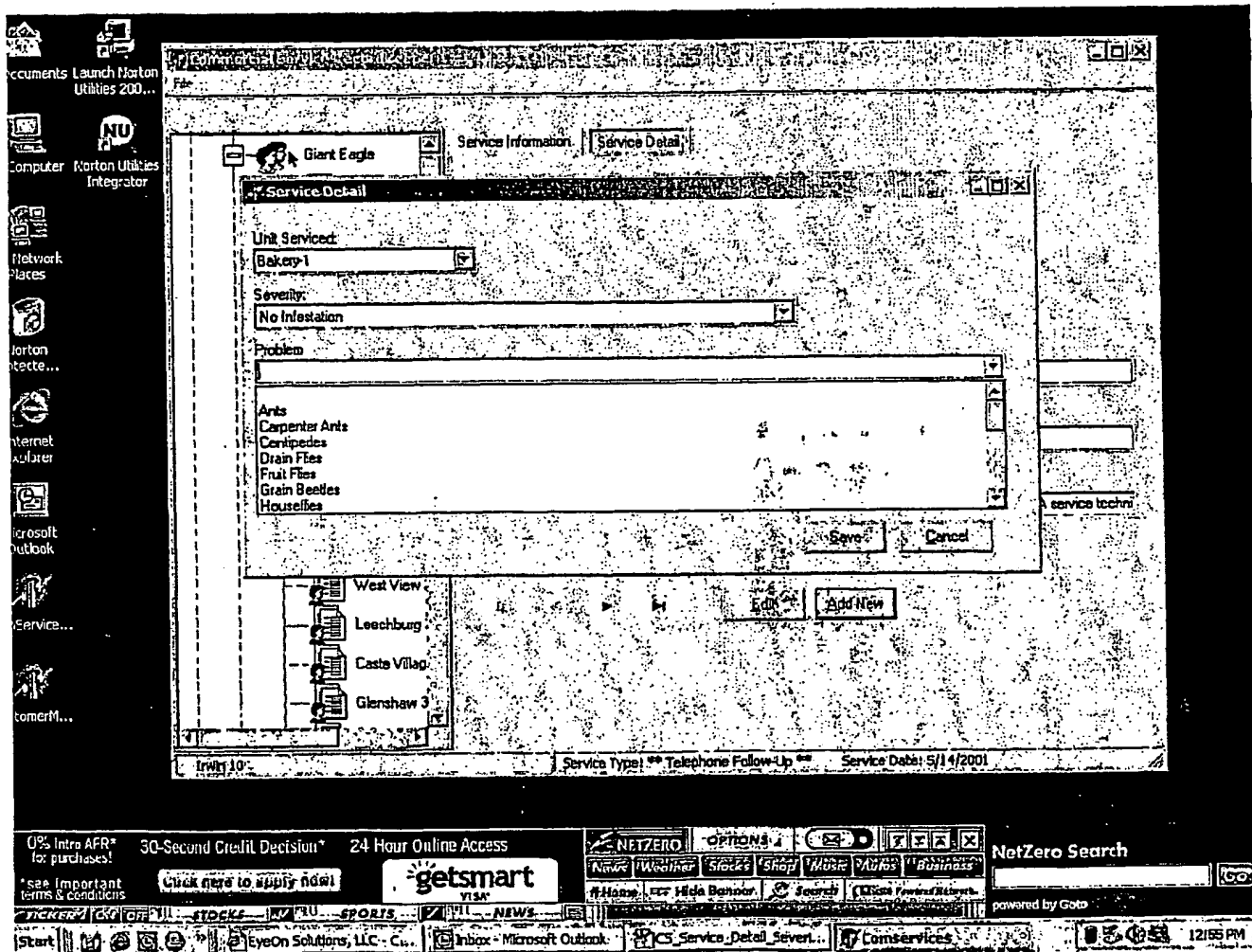


Fig 8F

documents Launch Norton Utilities 200...
Computer Norton Utilities Integrator
Network Places
Norton Internet...
Internet Explorer
Microsoft Outlook
Service...
Internet...

Giant Eagle Service Information **Service Detail**

Service Detail

Unit Served: Bakery-1

Severity: No Infestation

Problem: Ants

Recommended Corrective Action: The area where the pipes enter the building need to be caulked

Save Cancel

West View
Leechburg
Castle Village
Glenshaw 3

Irwin 10

Service Type: Telephone Follow-Up Service Date: 5/14/2001

FREE CREDIT REPORT ONLINE CLICK HERE
NETZERO OPTIONS: News Weather Stocks Shop Music Autos Autos
Home Hide Banner Search (Data Feeds and Referrals)
powered by Go2

Start | EyeOn Solutions, LLC - C... | Inbox - Microsoft Outlook | CS_Service_Detail_Proble... | Comservices | 12:56 PM

Fig 8G

My Documents L
My Computer M
My Network Places
Norton Protecte...
Internet Explorer
Microsoft Outlook

Help, click Help Topics on t

Irwin 10

Service Information: Service Data

Service Detail

Unit Served:
Bakery-1

Severity:
No Infestation

Problem:
Ants

Recommended Corrective Action:
Clean the area around the display case. Some crumbs were found underneath.

Comments:
All areas have been inspected and treated, no activity was found at the time of service.
All areas have been inspected and treated, no activity was found at the time of service. The exterior was also treated for fly co.
All areas have been inspected and treated, no activity was found or reported at the time of service. All E.I.W.O. were inspected.
All areas have been inspected and treated, NO OTHER activity was found or reported at the time of service.

West View
Leechburg
Castle Village
Glenshaw 3

Edit Add New

Service Type: Telephone Follow-Up Service Date: 5/14/2001

Get A Price Choose Make Price Search

NETZERO OPTIONS News Weather Stocks Shop Music Autos Business

Home HTF Hide Banner Search Site Forward Return

powered by Goto

Start EyeOn Solutions, LLC - G... Inbox - Microsoft Outlook CS_Service_Detail_Action... Comservices 12:58 PM

Fig 8H

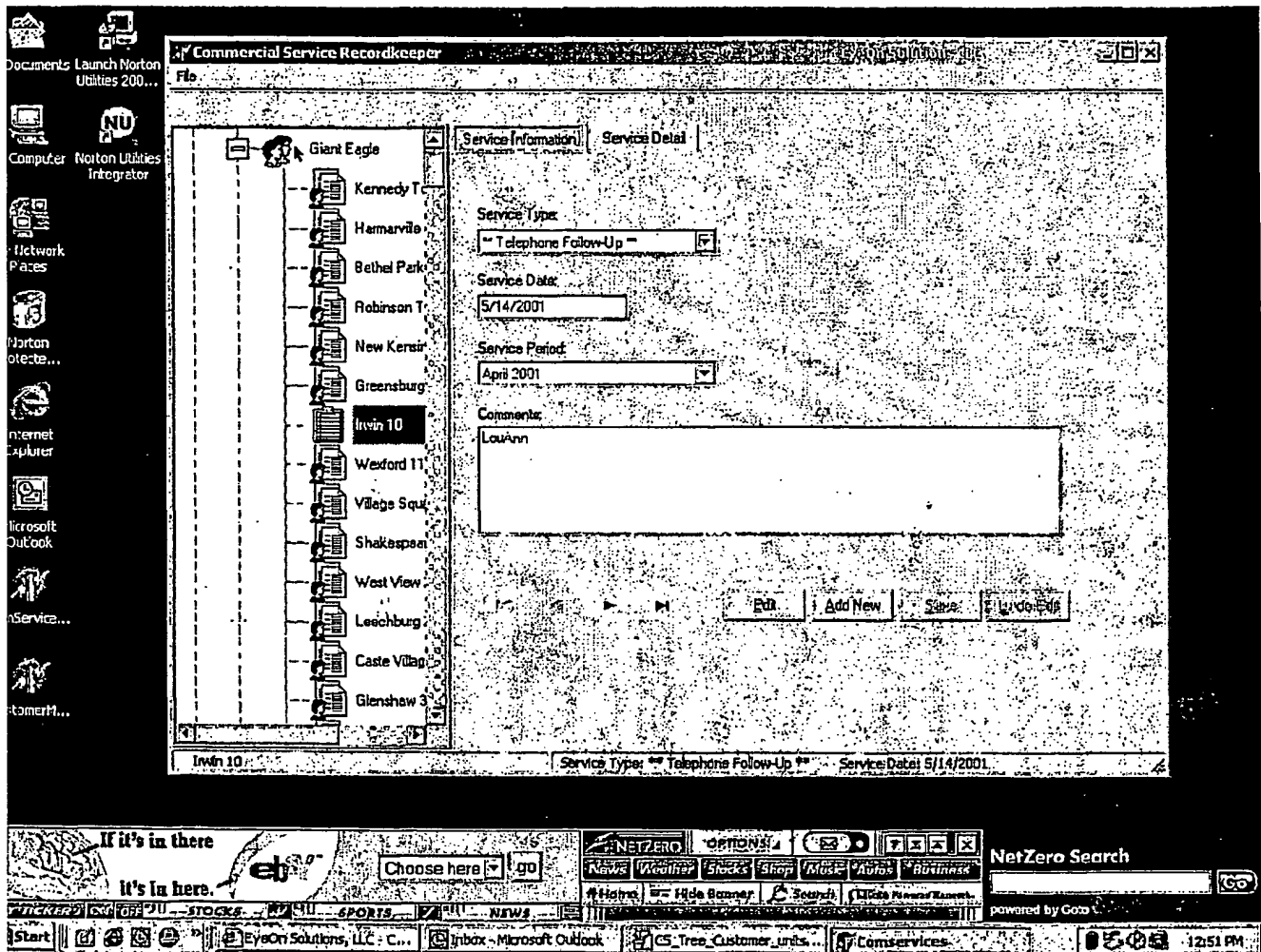


Fig 8I

The screenshot displays a web application interface for NetZero. On the left, a vertical list of locations is shown, with 'Irwin 10' selected. The main content area, titled 'Service Detail', contains the following information:

- Unit Served:** Irwin 10
- Severity:** Not Applicable
- Problem:** None
- Recommended Corrective Action:**
- Comments:** Spoke to LouAnn, the problem in the bakery has improved but she is still seeing a little activity. A service technician is scheduled for 5/14/2001.

Below the comments, there are 'Edit' and 'Add New' buttons. At the bottom of the service detail window, it shows 'Service Type: Telephone Follow-Up' and 'Service Date: 5/14/2001'.

Below the service detail window, there is a banner for 'Click here for your free credit report online!'. To the right of this banner is a 'NetZero Search' box with a 'Go' button. Below the search box, it says 'powered by Google'.

The bottom of the page features a navigation bar with links for 'Start', 'Home', 'Stocks', 'Sports', 'News', 'EyeOn Solutions, LLC', 'Inbox - Microsoft Outlook', 'CS_Service_Detail_Comm...', 'Comservices', and a clock showing '12:59 PM'.

Fig 8J

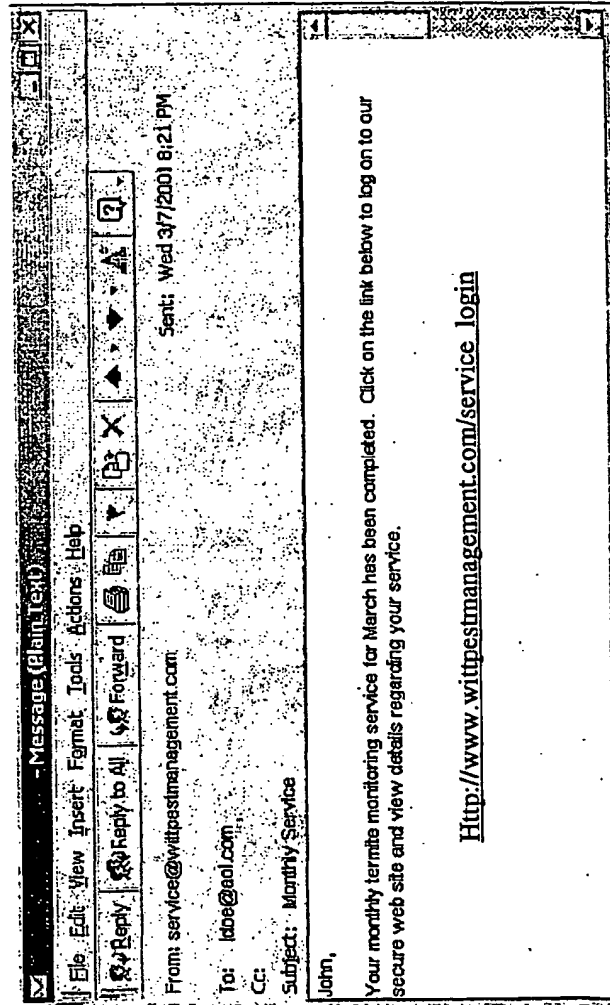


Fig 9A


The screenshot shows a web browser window with the title bar "Eye On Solutions, LLC - Customer Login - Microsoft Internet Explorer". The address bar displays "Http://www.witpestmanagement.com/service_login". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", "Help", and "Send". The toolbar contains "Back", "Forward", "Search", "Favorites", "History", and "Home" buttons. The main content area features the "Eye On Solutions" logo, which consists of a stylized eye icon and the company name. Below the logo is a login form with two input fields: "User Name:" containing the text "jdoe" and "Password:" containing "*****". A "Log In" button is positioned to the right of the password field. At the bottom of the page, a copyright notice reads: "Copyright 2001. Eye On Solutions, LLC. All Rights Reserved. Eye On Solutions is a patent pending process." The browser's status bar at the bottom shows "Done" and "Internet".

Eye On Solutions, LLC - Customer Login - Microsoft Internet Explorer

File Edit View Favorites Tools Help Send

Back Forward Search Favorites History Home

Address: Http://www.witpestmanagement.com/service_login

 **Eye On Solutions**

User Name: jdoe
Password: *****
Log In


Copyright 2001. Eye On Solutions, LLC. All Rights Reserved.
Eye On Solutions is a patent pending process.

Done Internet

Fig 9B

Fig 9C


Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions

Home
Admin
Providers
Reports

318 Longwood Drive
Pittsburgh, PA 15221



WITT
PEST MANAGEMENT
Termite Continuous
Protection Plan

Account Status

Service Schedule

Building Layouts

Detail Reports

Send Your Comments

How Witt

Site Overview

Last Service Date: March 3, 2001
Next Service Date: May 6, 2001
First Hit Date: June 12, 2000
Station Count: 31
Linear Footage: 145

Provider Update

We have recently changed our name to Witt Pest Management. This helps to demonstrate our commitment to service and to our customers.

Spring marks the beginning of termite season. For more information on how to identify a termite and what to do if you see them, please [click here](#).

Fig 9CC











<p>Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM</p>	 <h1>Eye On Solutions</h1>	<p>Home Main Admin Providers Reports</p>			
<p>Select the Provider System at the left that you would like to access at this time</p>					
<table border="1"> <tr> <td data-bbox="495 1501 669 1801">  <p>WITT PEST MANAGEMENT Pest Management Reporting System</p> </td> <td data-bbox="706 1501 868 1801">  <p>Watch-Gard Systems Sanitation Evaluation Reporting System</p> </td> <td data-bbox="909 1501 1071 1801">  <p>SONITROL Security Real-Time Reporting System</p> </td> </tr> </table>			 <p>WITT PEST MANAGEMENT Pest Management Reporting System</p>	 <p>Watch-Gard Systems Sanitation Evaluation Reporting System</p>	 <p>SONITROL Security Real-Time Reporting System</p>
 <p>WITT PEST MANAGEMENT Pest Management Reporting System</p>	 <p>Watch-Gard Systems Sanitation Evaluation Reporting System</p>	 <p>SONITROL Security Real-Time Reporting System</p>			

Fig 1D








<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	 <h1>Eye On Solutions</h1>	 <p> WITT PEST MANAGEMENT Termite Continuous Protection Plan </p>	<p> Account Status 318 Longwood Drive Pittsburgh, PA 15221 </p>	<p>  Account Status  Service Schedule  Building Layout  Detail Reports  Send Your Comments </p>	<table border="1"> <thead> <tr> <th colspan="2">Past Payments</th> </tr> <tr> <th>Date</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>10/16/2000</td> <td>\$ 59.00</td> </tr> <tr> <td>11/12/2001</td> <td>\$ 59.00</td> </tr> <tr> <td>12/16/2000</td> <td>\$ 59.00</td> </tr> <tr> <td>01/20/2001</td> <td>\$ 59.00</td> </tr> <tr> <td>02/16/2001</td> <td>\$ 59.00</td> </tr> <tr> <td>03/16/2000</td> <td>\$ 59.00</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Open Invoices</th> </tr> <tr> <th>Date</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>03/10/2000</td> <td>\$ 59.00</td> </tr> </tbody> </table>	Past Payments		Date	Amount	10/16/2000	\$ 59.00	11/12/2001	\$ 59.00	12/16/2000	\$ 59.00	01/20/2001	\$ 59.00	02/16/2001	\$ 59.00	03/16/2000	\$ 59.00	Open Invoices		Date	Amount	03/10/2000	\$ 59.00
Past Payments																											
Date	Amount																										
10/16/2000	\$ 59.00																										
11/12/2001	\$ 59.00																										
12/16/2000	\$ 59.00																										
01/20/2001	\$ 59.00																										
02/16/2001	\$ 59.00																										
03/16/2000	\$ 59.00																										
Open Invoices																											
Date	Amount																										
03/10/2000	\$ 59.00																										

Fig 9E

Logged In	John Doe
Current Time	3/21/2001 11:00:00 AM
Last Login	3/20/2001 11:00:00 AM



WITT
BEST MANAGEMENT

Termite Continuous
Protection Plan

Account Status

Service Schedule

Building Layouts

Detail Reports

Send Your Comments

THE NEW YORK PUBLIC LIBRARY

Home
mer Admin
n Providers
egout

Eye On Solutions

Service Schedule

Pittsburgh, PA 15221

318 Longwood Drive

Year View

Month View

Week View

Go To
Today


March 2001

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30 Joe Douglas Monthly Monitoring	31

Copyright 2001. Eye On Solutions, LLC. All Rights Reserved. Eye On Solutions is a patent pending process.


Fig 9F

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions

Home
Admin
Providers
Logout



WITT
TERMITE MANAGEMENT
Protection Plan

Account Status

Service Scheduling

Building Layouts

Detail Reports

Send Your Comments

To WITT

Building Layout

318 Longwood Drive

Pittsburgh, PA 15221

Rear Deck

Front Porch

1

2

3

4

Fig 96

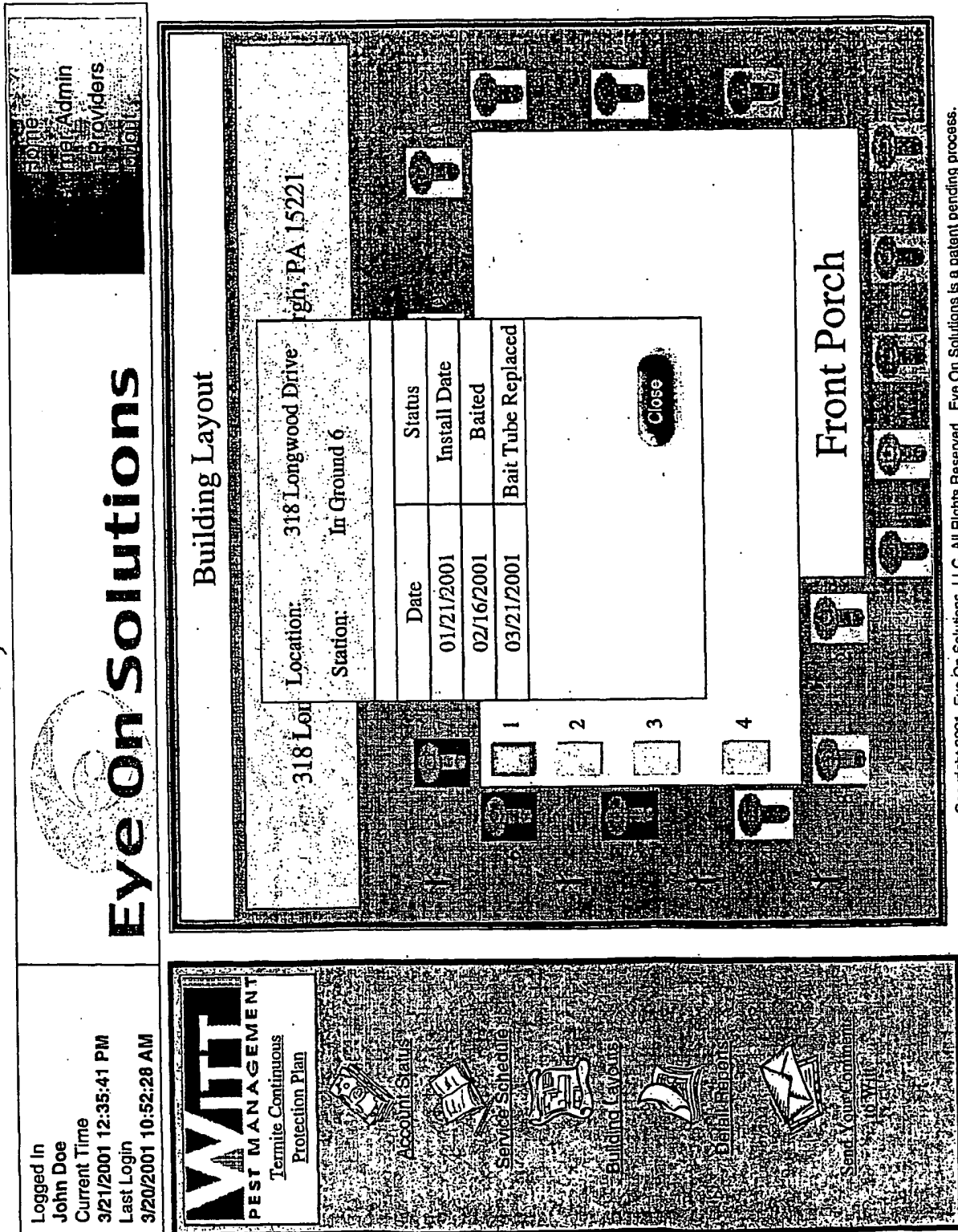


Fig 9H

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM

WITT
PEST MANAGEMENT
Termite Continuous
Protection Plan

Account Status
 Service Schedule
 Building Reports
 Detail Reports
 Send Your Comments to WITT

Eye On Solutions

Home
 Member Admin
 Providers
 About

Detail Report

318 Longwood Drive

Pittsburgh, PA 15221

Detail Report - Enter Report Criteria

Property:

Station:

Service Period:

Service Date Range:

▼

▼

▼

▼


to

SUBMIT

RESET


Fig. 11

Logged In
John Doe
 Current Time
 3/21/2001 12:35:41 PM
 Last Login
 3/20/2001 10:52:28 AM



Eye On Solutions

[Home](#)
[Admin](#)
[Providers](#)
[Report](#)



WITT
PEST MANAGEMENT
 Termite Continuous
 Protection Plan

Account Status

Service Schedule

Buildout Levels

Detail Reports

Send Your Comments

Detail Report

318 Longwood Drive

Pittsburgh, PA 15221

Detail Report - Enter Report Criteria

Property:

▼

Station:

▼

Service Period:

▼

Service Date Range:



▼





SUBMIT

RESET

▼
In Ground 1
In Ground 2
In Ground 3
In Ground 4
In Ground 5
In Ground 6
In Ground 7
▼

Fig 9J

<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	<p>  Eye On Solutions </p>	<p>  WITT PEST MANAGEMENT Termite Continuous Protection Plan </p>	<div data-bbox="293 352 451 625"> <p> Home User Admin Providers Support </p> </div> <div data-bbox="500 758 548 989"> <h3>Detail Report</h3> </div> <div data-bbox="630 499 667 772"> <p>Pittsburgh, PA 15221</p> </div> <div data-bbox="630 982 667 1255"> <p>318 Longwood Drive</p> </div> <div data-bbox="760 625 797 1129"> <h4>Detail Report - Enter Report Criteria</h4> </div> <div data-bbox="841 352 1008 1402"> <table border="0"> <tr> <td>Property:</td> <td><input type="text"/></td> <td>Station:</td> <td><input type="text"/></td> <td>In Ground 6</td> <td><input type="text"/></td> </tr> <tr> <td>Service Period:</td> <td><input type="text"/></td> <td>Service Date Range:</td> <td><input type="text"/></td> <td>01/01/2001</td> <td>to 03/31/2001</td> </tr> </table> </div> <div data-bbox="1068 653 1122 1136"> <p>SUBMIT RESET</p> </div>	Property:	<input type="text"/>	Station:	<input type="text"/>	In Ground 6	<input type="text"/>	Service Period:	<input type="text"/>	Service Date Range:	<input type="text"/>	01/01/2001	to 03/31/2001
Property:	<input type="text"/>	Station:	<input type="text"/>	In Ground 6	<input type="text"/>										
Service Period:	<input type="text"/>	Service Date Range:	<input type="text"/>	01/01/2001	to 03/31/2001										

 Account Status
 Service Schedule
 Building Layouts
 Detail Reports
 Send Your Comments to WITT

Witt Pest Management

3/23/2001 10:34:31 AM

Termite Continuous Protection Plan
DETAIL REPORT

318 Longwood Drive Pittsburgh, PA 15221

Station In Ground No. 6				
Service Type: Continuous Protection			Service Date: 01/21/2001	Service Period: February 2001
Unit	Value	Status	Condition of Termites	Conditions Found
In Ground 6	1	Install Date	N/A	N/A
Station In Ground No. 6				
Service Type: Continuous Protection			Service Date: 02/16/2001	Service Period: March 2001
Unit	Value	Status	Condition of Termites	Conditions Found
In Ground 6	3	First Hit	Active	Leaking downspouts.
In Ground 6	3	Baited	N/A	N/A
Station In Ground No. 6				
Service Type: Continuous Protection			Service Date: 03/21/2001	Service Period: March 2001
Unit	Value	Status	Condition of Termites	Conditions Found
In Ground 6	2	Bait tube replaced	Termites changing color to milky white.	Leaking downspouts.

Fig 9K

Fig 7L








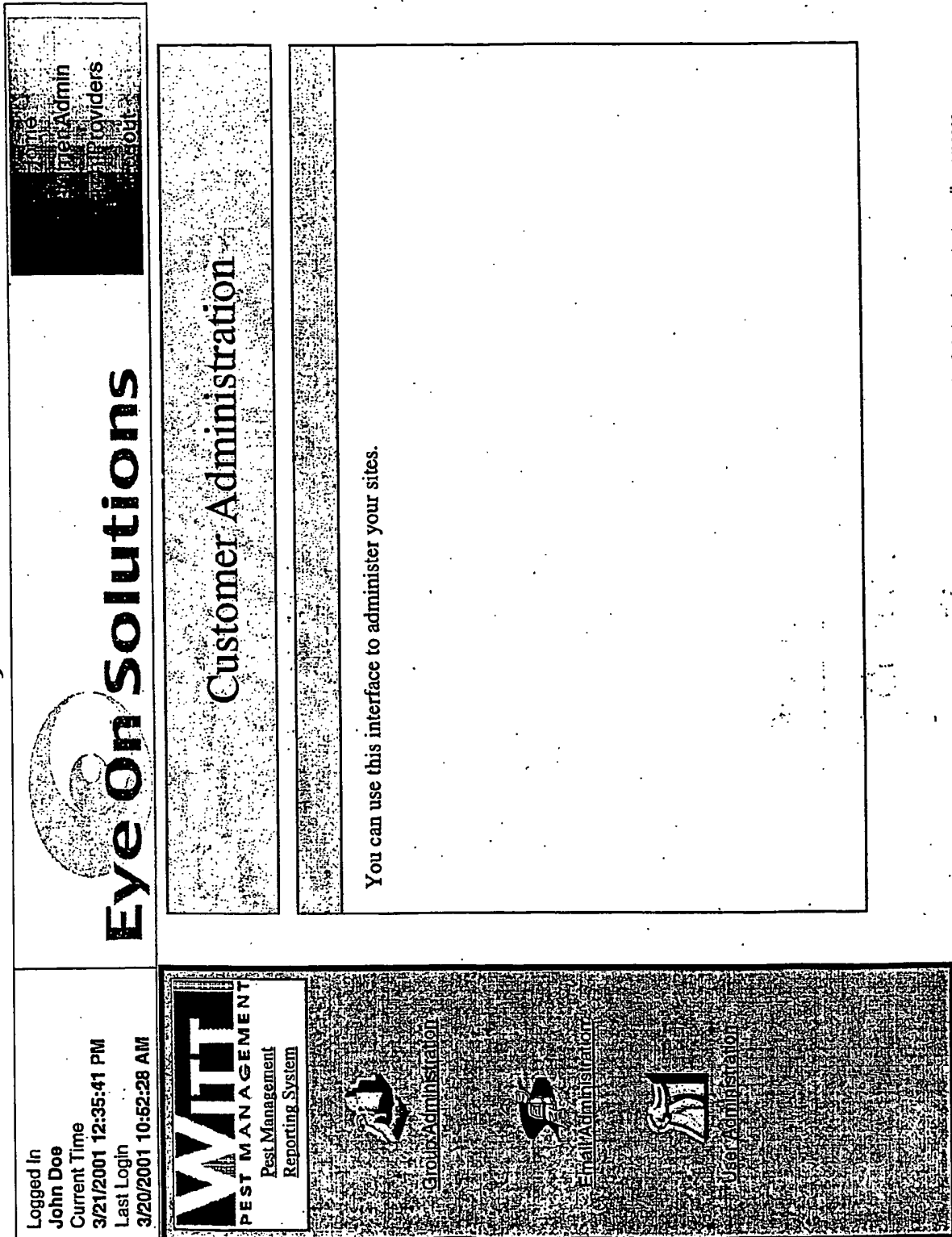

<p>Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM</p>	 <h1>Eye On Solutions</h1>	<p>Home Admin Providers</p>
<div>  <p>WITT PEST MANAGEMENT Termite Continuous Protection Plan</p> </div> <div>  Account Status  Service Schedule  Building Events  Dead Insects  Send Your Comments </div>		
<p>318 Longwood Drive Pittsburgh, PA 15221</p>		
<p>Enter your comments and click send</p> <p>Subject: <input type="text"/></p> <p>Message: <input type="text"/></p> <p><input type="button" value="SUBMIT"/> <input type="button" value="RESET"/></p>		

Fig 10A




Logged In
 John Doe
 Current Time
 3/21/2001 12:35:41 PM
 Last Login
 3/20/2001 10:52:28 AM




Eye On Solutions


Home
 Admin
 Providers




WITT
 PEST MANAGEMENT
 Pest Management
 Reporting System



Group Administration



Email Administration



User Administration

Customer Administration

Group Administration

Groups:

Regions
101
102
103
104
105

Create New Group Type

Create New Group

Edit Selected Group

Rename Selected Group Type

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions



WITT
PEST MANAGEMENT
Pest Management
Reporting System



Group Administration



Email Administration



User Administration

Customer Administration

Group Administration

Groups:

Regions	
101	
102	
103	
104	
105	

Create New Group Type

Create New Group

Edit Selected Group

Rename Selected Group Type

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Group Administration



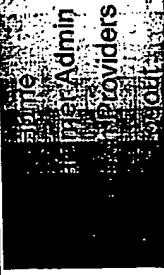
Email Administration



User Administration



Eye On Solutions



Customer Administration

Group Administration

Group Name:

102

Available Units:

Stores

- 10: Georgetown
 - ☐ Departments
 - ☐ Bakery
 - ☐ Deli
 - ☐ Prepared Foods
- 15: Arlington
 - ☐ Departments

Selected Units:


Stores

- 20: Clarendon
 - ☐ Departments
 - ☐ Bakery
 - ☐ Deli
 - ☐ Prepared Foods
- 25: Rockville
 - ☐ Departments

SUBMIT


RESET

Home
 User Admin
 Providers
 Logout




Eye On Solutions


Logged In
 John Doe
 Current Time
 3/21/2001 12:35:41 PM
 Last Login
 3/20/2001 10:52:28 AM




WMT
 PEST MANAGEMENT
 Pest Management
 Reporting System



Group Administration



Email Administration



User Administration

Customer Administration

Email Administration

Email Protocols:

Daily Update
Value = 4

Create New

Edit Selected

Add Users To

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM

WIT
PEST MANAGEMENT
Pest Management
Reporting System



Group Administration



Email Administration



User Administration



Eye On Solutions

Field
Manager Admin
Providers

Customer Administration

Email Administration

Email Protocols:

Weekly Summary

Frequency:

Day:


Trigger:

Value:

SUBMIT

RESET

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions

Home
Pest Admin
Providers
339011

Customer Administration

Email Administration

Email Protocols:

Frequency:	Day:	Value:
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">▼</div> <div style="border: 1px solid black; padding: 2px; flex-grow: 1;"> <div style="border-bottom: 1px solid black; padding: 2px;">Any</div> <div style="border-bottom: 1px solid black; padding: 2px;">Daily</div> <div style="border-bottom: 1px solid black; padding: 2px;">Weekly</div> <div style="border-bottom: 1px solid black; padding: 2px;">Monthly</div> </div> <div style="border: 1px solid black; padding: 2px; margin-left: 5px;">▼</div> </div>	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">▼</div> <div style="border: 1px solid black; padding: 2px; flex-grow: 1;"></div> <div style="border: 1px solid black; padding: 2px; margin-left: 5px;">▼</div> </div>	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">▼</div> <div style="border: 1px solid black; padding: 2px; flex-grow: 1;"></div> <div style="border: 1px solid black; padding: 2px; margin-left: 5px;">▼</div> </div>

SUBMIT

RESET

WMTT
PEST MANAGEMENT
Pest Management
Reporting System



Group Administration




Email Administration



User Administration

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions

Home
Main Admin
Providers

Customer Administration

Email Administration

Email Protocols: Weekly Summary

Frequency: Weekly

Trigger:

Day:

Value:

March 2001

S	M	T	W	T	F	S
25	26	27	28	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Today

SUBMIT
RESET



WITT
PEST MANAGEMENT
Pest Management
Reporting System



Group Administration



Email Administration



User Administration

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM

WITT
PEST MANAGEMENT
Pest Management
Reporting System



Group Administration



Email Administration



User Administration



Eye On Solutions

Home
User Admin
Providers

Customer Administration

Email Administration

Email Protocols:

Weekly Summary

Frequency:

Weekly

Day:

Every Monday begin 3/26/01

Trigger:

▼	Any
▲	Group
▼	Unit
▼	Value

Value:

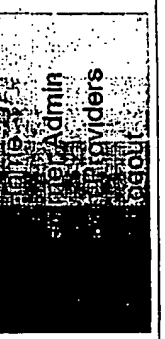
SUBMIT

RESET

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions



Customer Administration

Email Administration

Email Protocols:

Weekly Summary

Frequency:

Weekly

Day:

Every Monday begin 3/26/01

Trigger:


Group

Value:

Region: 101

SUBMIT


RESET




Eye On Solutions

Home
Admin
Providers
Locations


Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM




WMT
PEST MANAGEMENT
Pest Management
Reporting System



Group Administration



Email Administration



User Administration

Customer Administration

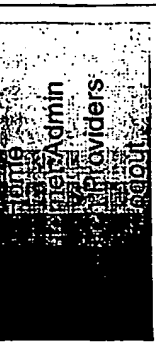
User Administration

Add Users

Edit Users

Reset User Passwords

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Eye On Solutions

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM

WIT
PEST MANAGEMENT
Pest Management
Reporting System

Customer Administration

User Administration			
User Information	Groups Assignments	Functional Areas	Email Notification
User Name:	<input type="text"/>	Email Address:	<input type="text"/>
First Name:	<input type="text"/>	Last Name:	<input type="text"/>
Address 1:	<input type="text"/>		
Address 2:	<input type="text"/>		
City:	<input type="text"/>	State: <input type="text"/>	Zip: <input type="text"/>
Phone:	<input type="text"/>	Fax:	<input type="text"/>
Mobile:	<input type="text"/>	Pager:	<input type="text"/>
<input type="button" value="SUBMIT"/>		<input type="button" value="RESET"/>	

* Entries marked in Red are required.

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM

WIT
PEST MANAGEMENT
Pest Management
Reporting System



Eye On Solutions

Home
My Profile
My Account
My Providers
Logout

Customer Administration

User Administration

User Information	Groups Assignments	Functional Areas	Email Notification
------------------	--------------------	------------------	--------------------

User Name: Email Address:

First Name: Last Name:

Address 1:

Address 2:

City:

Phone:

Mobile:

State:

Fax:

Pager:

Zip:

SUBMIT

RESET

* Entries marked in Red are required.



Eye On Solutions

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM









WIT
PEST MANAGEMENT
Pest Management
Reporting System

Customer Administration

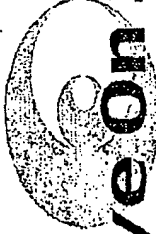

User Administration

Are you sure that you want to submit this new user? Review the user information that you submitted below and click yes to submit. After you accept this information, the system will generate a random password for this user and send an email to the email address provided instructing the user to log in to the system with the newly generated password. Once logged in, the user will be given the opportunity to change the system generated password.

UserName: jdoe	Address 1: Store #35	Phone: 412-555-1234
First Name: John	Address 2: 123 Main Street	Fax: 412-555-4321
Last Name: Doe	City: Pittsburgh	Mobile: N/A
Email: jdoe@aol.com	State: PA	Pager: N/A
	Zip: 15217	

<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	 <h1>Eye On Solutions</h1>	<div data-bbox="462 1470 1339 1816">  <div>  <p>Group Administration</p> </div> <div>  <p>Email Administration</p> </div> <div>  <p>User Administration</p> </div> </div> <div data-bbox="462 294 1339 1470"> <div>  <p>Customer Administration</p> </div> <div>  <p>User Administration</p> </div> <div> <p>Select a user to edit:</p> <div> <input type="text"/> </div> <div> <input type="button" value="SUBMIT"/> </div> </div> </div>	<div data-bbox="276 294 446 630">  </div>
---	---	--	--

<p> Eye On Solutions WITT PEST MANAGEMENT Pest Management Reporting System </p>	<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	<div data-bbox="284 283 462 619"> <p> Home Home Admin Providers About </p> </div> <div data-bbox="462 336 609 1407"> <p>Customer Administration</p> </div> <div data-bbox="609 336 690 1407"> <p>User Administration</p> </div> <div data-bbox="690 336 1339 1407"> <p>Select a user to edit:</p> <table border="1"> <tr> <td>John Doe</td> </tr> <tr> <td>Joe Smith</td> </tr> <tr> <td>Harry Time</td> </tr> </table> </div>	John Doe	Joe Smith	Harry Time
John Doe					
Joe Smith					
Harry Time					

<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	 <h1>Eye On Solutions</h1>	 <p> WITT PEST MANAGEMENT Pest Management Reporting System </p>	<div data-bbox="511 598 576 1165">Customer Administration</div> <div data-bbox="641 703 690 1060">User Administration</div> <div data-bbox="852 924 893 1165">Select a user to edit:</div> <div data-bbox="909 661 966 1165"> <input type="text" value="John Doe"/> </div> <div data-bbox="1023 808 1079 1018"> <input type="button" value="SUBMIT"/> </div>
---	---	---	--

Logged In:
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions

Eye On
Solutions
Admin
Providers

Customer Administration

User Administration

User Information	Groups Assignments	Functional Areas	Email Notification
User Name: <input type="text" value="jdoe"/>	Email Address: <input type="text" value="jdoe@aol.com"/>		
First Name: <input type="text" value="John"/>	Last Name: <input type="text" value="Doe"/>		
Address 1: <input type="text" value="Store #35"/>			
Address 2: <input type="text" value="123 Main Street"/>			
City: <input type="text" value="Pittsburgh"/>	State: <input type="text" value="PA"/> Zip: <input type="text" value="15217"/>		
Phone: <input type="text" value="412-555-1234"/>	Fax: <input type="text" value="412-555-4321"/>		
Mobile: <input type="text"/>	Pager: <input type="text"/>		

User Name: Email Address:

First Name: Last Name:

Address 1:

Address 2:

City: State: Zip:

Phone: Fax:


Mobile: Pager:

SUBMIT

RESET


* Entries marked in Red are required.

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions

Region 101
Region 102
Region 103
Region 104
Region 105
Region 106
Region 107
Region 108
Region 109
Region 110
Region 111
Region 112



WMTT
PEST MANAGEMENT
Pest Management
Reporting System

Group Administration
Email Administration
User Administration

User Information
Groups Assignments
Functional Areas
Email Notification

User: Doe, John

Available Groups:

Region 101

Region 102

Region 103

Region 105

Selected Groups:

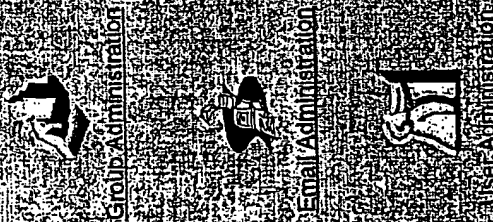
Region 104

SUBMIT

RESET

* Entries marked in Red are required.

Logged In
John Doe
Current Time
3/21/2001 12:35:41 PM
Last Login
3/20/2001 10:52:28 AM



Eye On Solutions



Customer Administration

User Administration

User Information	Groups Assignments	Functional Areas	Email Notification
------------------	--------------------	------------------	--------------------

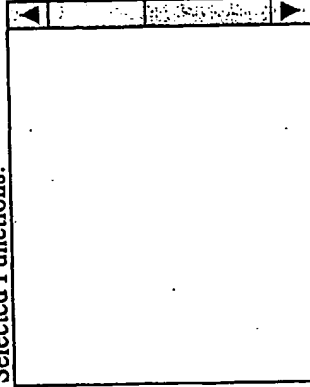
User:

Doc, John

Available Functions:

- User Administration
- Group Administration
- Email Administration
- Pre-configured Detail Report
- User Defined Detail Report
- Send Comments


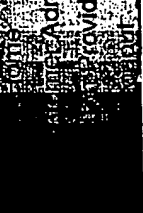




Selected Functions:




SUBMIT







RESET


* Entries marked in Red are required.


Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:29 AM	 <h1>Eye On Solutions</h1>												
 WITT PEST MANAGEMENT Pest Management Reporting System			<h2>Customer Administration</h2>										
 Group Administration  Email Administration  User Administration			<table border="1"> <thead> <tr> <th>User Information</th> <th>Groups Assignments</th> <th>Functional Areas</th> <th>Email Notification</th> </tr> </thead> <tbody> <tr> <td colspan="4"> <div> <div> User: <div> Doe, John </div> </div> <div> Available Email Groups: <div> Daily Update Value = 4 Weekly Summary </div> </div> <div> Selected Email Groups: <div></div> </div> </div> <div> <div>SUBMIT</div> <div>RESET</div> </div> </td> </tr> </tbody> </table>			User Information	Groups Assignments	Functional Areas	Email Notification	<div> <div> User: <div> Doe, John </div> </div> <div> Available Email Groups: <div> Daily Update Value = 4 Weekly Summary </div> </div> <div> Selected Email Groups: <div></div> </div> </div> <div> <div>SUBMIT</div> <div>RESET</div> </div>			
User Information	Groups Assignments	Functional Areas	Email Notification										
<div> <div> User: <div> Doe, John </div> </div> <div> Available Email Groups: <div> Daily Update Value = 4 Weekly Summary </div> </div> <div> Selected Email Groups: <div></div> </div> </div> <div> <div>SUBMIT</div> <div>RESET</div> </div>													


* Entries marked in Red are required.

<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	 <h1>Eye On Solutions</h1>	<p> WIT PEST MANAGEMENT Pest Management Reporting System </p>	<h2>Customer Administration</h2>	<h2>User Administration</h2>	<p>Select a user:</p> <div data-bbox="797 663 842 1157" style="border: 1px solid black; height: 235px; position: relative;"> <div style="position: absolute; top: 0; right: 0; width: 10px; height: 10px; background: black; color: white; text-align: center; line-height: 10px;">▼</div> </div> <p style="text-align: center;">or</p> <p style="text-align: center;"><u>Reset all user passwords</u></p> <div data-bbox="1195 810 1252 1020" style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;"> SUBMIT </div>
--	---	--	----------------------------------	------------------------------	---

<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	<div data-bbox="293 1136 435 1373">  </div> <div data-bbox="380 737 440 1451"> <h1>Eye On Solutions</h1> </div> <div data-bbox="277 289 440 632">  <p> Home Enter Admin Providers Logout </p> </div>						
<div data-bbox="467 1493 634 1801">  <p> WITT PEST MANAGEMENT Pest Management Reporting System </p> </div> <div data-bbox="683 1612 764 1696">  <p>Group Administration</p> </div> <div data-bbox="889 1612 971 1696">  <p>Email Administration</p> </div> <div data-bbox="1052 1612 1133 1696">  <p>User Administration</p> </div>							
<div data-bbox="505 604 553 1157"> <h2>Customer Administration</h2> </div> <div data-bbox="630 709 678 1052"> <h2>User Administration</h2> </div> <div data-bbox="850 932 883 1157"> <p>Select a user to edit:</p> </div> <div data-bbox="906 667 1078 1157"> <table border="1"> <tr> <td>▼</td> <td>John Doe</td> </tr> <tr> <td>▲</td> <td>Joe Smith</td> </tr> <tr> <td>▼</td> <td>Harry Time</td> </tr> </table> </div>		▼	John Doe	▲	Joe Smith	▼	Harry Time
▼	John Doe						
▲	Joe Smith						
▼	Harry Time						

<p> WIT PEST MANAGEMENT Reporting System </p>	<p>  Eye On Solutions </p>
<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	<p> Customer Administration </p> <p> User Administration </p> <div> <p>Select a user to edit:</p> <p> <input type="text" value="John Doe"/> </p> <p> <input type="button" value="SUBMIT"/> </p> </div>

<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	 <h1 style="margin: 0;">Eye On Solutions</h1>
<p> WIT PEST MANAGEMENT Pest Management Reporting System </p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">Home Admin Providers Logout</p> </div> <div style="border: 1px solid black; padding: 10px; margin-bottom: 5px;"> <h2 style="text-align: center; margin: 0;">Customer Administration</h2> </div> <div style="border: 1px solid black; padding: 10px;"> <h2 style="text-align: center; margin: 0;">User Administration</h2> <p style="margin-top: 20px;"> Are you sure that you want to reset the user passwords for the user(s) listed below? After you accept this information, the system will generate a random password for this user and send an email to the email address provided instructing the user to log in to the system with the newly generated password. Once logged in, the user will be given the opportunity to change the system generated password. </p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">jdoe</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px 15px;">YES</div> <div style="border: 1px solid black; padding: 5px 15px;">NO</div> </div> </div>

<p> Logged In John Doe Current Time 3/21/2001 12:35:41 PM Last Login 3/20/2001 10:52:28 AM </p>	 <h1>Eye On Solutions</h1>	<p> Home Help Admin Providers </p>
<h2>Customer Administration</h2>		
<h3>User Administration</h3>		
<p>Are you sure that you want to reset the user passwords for the user(s) listed below? After you accept this information, the system will generate a random password for this user and send an email to the email address provided instructing the user to log in to the system with the newly generated password. Once logged in, the user will be given the opportunity to change the system generated password.</p> <div data-bbox="982 420 1136 1312"> <p>Reset all user passwords</p> </div> <div data-bbox="1209 913 1274 1123"> <p>YES</p> </div> <div data-bbox="1209 630 1274 840"> <p>NO</p> </div>		

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G06F17/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, INSPEC, IBM-TDB, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 924 949 A (GIERTH ROBERT CHRISTIAN) 23 June 1999 (1999-06-23) abstract figures 1-4 page 2, line 1 -page 5, line 27	1-27
X	US 6 052 066 A (SU NAN-YAO) 18 April 2000 (2000-04-18) cited in the application abstract column 3, line 12 -column 5, line 35 figures 1-3,6,7	1-27

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

11 June 2003

Date of mailing of the international search report

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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